THE

SOUTHERN AGRICULTURIST.

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PART I.

ORIGINAL CORRESPONDENCE.

ART. XXXI.—*Answers to Queries on the Culture of Rice; by* COLUMELLA.

Mr. Editor,—Experience has convinced me that there can be no uniformity in the mode of cultivating rice, even on the same plantation for a consecutive series of years; system there must be, but that must yield to the tyranny of circumstances and seasons. The principal thing is to understand the peculiarities of the soil, its advantages as to flowing and drainage, and the grasses which infest it most, and whether of a character to be managed by water or the hoe. This view of the case, and my wish to aid your valuable efforts, must plead an excuse for the indecisive and somewhat vague answers returned you by

COLUMELLA.

Query 1. What preparation is given the land prior to planting, is it broken up by the plough or hoe?

Answer. The best preparation of land prior to planting, depends upon the quality of the soil. If friable, light and rich, the hoe is the best implement for turning it; if of a clay texture and stubborn, the plough is preferable, and worked as deep as practicable, since the luxuriance of the growth depends much on the depth or tilth of the cultivation. On lands of the first description, chopping is the next process, and is enough. On the latter chopping and

harrowing are both advisable, though the latter is alone used at times for expedition. I would remark that in the cultivation of stiff clay land, the preparation for the reception of the seed is one of the most important points.

After the land has been digged or ploughed, if clay, it is very noxious to flow it, as it destroys the action of the frost, which would pulverize and improve it for planting. Lighter lands may be treated differently, and it is my opinion, that all lands are enriched even by the winter flowing, though the banks and ditches are apt to be injured.

2. When is planting commenced?

A. The time to commence planting depends much on the warmth or coldness of the soil, varying from the 20th of March to the 10th of April, but I think the safest is to begin about the 1st of April.

3. Are the seeds selected, and by what are they judged. Is there any preference to be given to seed obtained from the North or South, or from river or swamp-land—how often is the seed changed—how is seed-rice best obtained?

A. The best seed is that which is freest from red, and that grown on inland swamp is generally the best, both as to the above requisite, and in consequence of the grain being larger and more pearly. I have seen seed-rice with not a grain of red in a quart.

4. How near are the rows, and what quantity of seed is used per acre?

A. If the land is in fine order, I prefer the near trenches, *i. e.* fourteen inches and string planting, but in clay lands, which are always more or less lumpy, sixteen inches is the best distance; and the seed should be scattered in a trench about four inches wide at the bottom. In light alluvial land, a bushel and a half is the best quantity per acre. In clay lands, which of course, cannot tiller as much, two bushels per acre. The hoe trenching is preferable on account of neatness as to looks, and is also better than the plough trenching, inasmuch, as it is not so deep, and I prefer the light trench, from the impression, that rice tillers better the more it is planted on the surface, and also, because it has more loose soil below to sustain it, which is all important in stiff soils.

5. How are the seeds sown, in open trenches or on the string, do you cover or flow without?

A. In sowing, I never task the sowers, deeming it too important a part of the process for haste, I think, however, they do about one and three quarters of an acre. With respect to the covering with water instead of dirt, termed "the open trench planting," it answers perfectly well on light lands, but cannot possibly be substituted for the old mode in clay soils; as the rice is never sufficiently covered with mud to ensure its safety, even after it has taken root and the water been drawn off.

5. Do you use the point-flow, and what are the advantages?

A. I have not used, but seen much of the point-flow. Where the land is grassy, (with the exceptions of joint and goose grasses,) the soil of a clay texture, and the land level, the point-flow for about two days is very advantageous; but the water must not be deep enough to spindle the rice, nor used after the hot weather in May sets in, as the water is apt to heat and scald the rice. It is a flow which requires great judgment, and, therefore, cannot be recommended generally.

8. How often do you hoe before you put on the water? How long is the water kept on?

A. I endeavour to hoe twice before I put on the long-flow, as the rice, though apparently backened, in reality is acquiring vigorous roots, to derive the full benefit of the water, which unless to assist in mastering the grass, should not be kept on longer than ten days, as it makes the period between the long-flow and the joint-flow too short. It frequently happens, however, where the rice is combating grasses which the water can destroy, such as water-crab, and many others, which it can backen if it cannot destroy, or run them up so as to separate them from the rice; that the water should be put on before the rice has been hoed at all, as rice is more injured by the enmity of grass, that from any other cause.

9. Has the plough ever been used whilst the crop was growing?

A. Though very unusual, I have used a plough constructed for the purpose, to break up the alleys between the rice, when about ten inches high. It made a fine preparation for an immediately subsequent hoeing, but the trouble of clearing the lumps from the rice, and the new mode of near trenches, made me abandon it.

10. What is the after culture of the crop—what is the latest period in reference to the forwardness of the rice, at which the hoe might be used advantageously?

A. When the long-flow is drawn off, the rice should be kept as dry as possible, hoed, but not as deep as the second hoeing, picked clean and allowed to recover the dry growth, until the first joint appears, when the water should again be put on. I would on no account hoe rice as late as the period for it to joint, as it stands then in need of all the roots it has put forth. If grassy, it should be hand picked. I would, also, remark, that the water should be frequently changed, or purified with fresh water.

11. When ought the water to be turned off previous to cutting the rice?

A. The water should be drawn off preparatory to the harvest, about ten days, but planters, in general, from the apprehension of gales, keep it on longer.

12. How is the best period for cutting rice ascertained?

A. With respect to the time of cutting, I think it best when eight or ten grain at the foot of the ear are unmatured. They will harden after the rice is harvested, and much waste will be avoided.

ART. XXXII—*Observations on the Culture of Grasses; by* A HIGHLANDER.

Mr. Editor,—No one knows better than myself, the impatience with which the planters of Georgia and South-Carolina listen to recommendations to cultivate grasses. A large majority of them, by excessively overtasking their hands and horses in crops of corn and cotton, are obliged to run every thing almost off its legs, during the summer months, to keep down the crab and crow-foot grasses; these little spontaneous productions of the earth are regarded as the worst enemies to agricultural thrift, and one advising the use of any means to promote their growth, little better

than a simpleton. Yet, with the exception of three or four of the Southern States, there is no other country on the face of the earth, (so far as my information extends,) where grasses are not cultivated as an article of prime value to the husbandman. In most parts of Europe and the States of our Confederacy north and west of the Carolinas, lands which have any peculiar adaptation to the production of grass, bear a current price of double or treble that of arable, high and dry lands.

The planters of Georgia and Carolina are not more remarkable for these opinions and practices, in respect to the use of grasses, than are the fields they plough, for the wasted and hopeless condition of the soil, and the starved and shabby cattle that approach them in the intervals of crop growing. Have not these matters, the relation to each other, of cause and effect? I cannot doubt it. Is there a probability, in any climate or country, of preserving the fertility of fields without an habitual and extensive use of the grasses? No instance is recollected; and the total disuse of this branch of husbandry sufficiently accounts for the conversion of parts of Maryland, of Virginia, the Carolinas and Georgia, from a state of great original fertility, to one of barrenness.

I know it has been said a thousand times, that our climate is too arid for grass, "that this is a bad grass country, &c.;" but we also know that in the South of Europe, in North Africa, and in parts of Asia, corresponding in latitude and with a higher mean temperature than ours, that grasses are objects of systematic care with husbandmen, and their fields are not, in the cant phrase of our country, "worn out." So far, indeed, are they from being worn out, that in many provinces of Italy, Spain and France, under the discouragement of the vilest governments that ever cursed the life of man, they have become more fertile.

It is often said, too, amoung southern planters, that grass must not be cultivated for hay, because the corn blades supply an abundance of better forage. If our dwarfish "skin and bone" cattle and horses, had a vote on that question, it would be decided otherwise.

Beside the incalculable advantages of having on hand at all times, a bountiful supply of good hay forage, and the consequent production of much manure, the roots and

tops of the various grasses and other plants with which this country does or might abound, it is believed would sustain the fertility of our fields under a moderate course of cropping. The mass of vegetable matter that is found in the crab-grass roots, the growth of one season on an acre of land, would surprise most persons who have never seen them collected in heaps. Having once had occasion to plough and rake up the grass roots from a small plat of tolerable rich land, I found the quantity scarcely less than ten fold what had been expected. It was this accidental developement that explained, what had previously been a matter of some wonder; that our fields without any care of the soil, and under an unceasing course of exhausting crops for nearly forty years, should be found capable of producing any thing. I saw at once, that it was the roots of the crab-grass, this dire enemy of cotton and corn, this pest of the planter's life, which had enabled him, in spite of all his foolish improvidence, to keep himself and family alive.

I am apprized of no experiments in this State that would encourage a planter to import and cultivate foreign grasses; at any rate, before he had made a fair trial of those that are indigenous, and which are known to grow on moderately fertile fields by the use of one ploughing, followed by the harrow. Red clover, sainfoin, lucern and orchard grass, have been sown, and managed indeed, very badly, without much good result, except in resting the fields where they had a brief existence of a year or two. Among the foreign grasses which I have tried on high and dry land, the orchard grass has succeeded far the best. It grows on worn land, stands our hardest winters so well as to furnish better pasturage for calves and milch cows than rye lots, and the roots are so abundant as to add a great deal of vegetable matter to the soil in which it is permitted to grow as long as three years. On account of its abundant roots, its flourishing in cold weather, and keeping possession of the ground for several years, it is preferable to crab-grass; though less valuable as a fertilizer than red clover with its long tap root.

HIGHLANDER.

ART. XXXIII.—*Account of the Cotton Crop of* 1832, *in West Filiciana, (La.) with Observations on Reeling Silk; by* J. B. BREWER.

In compliance with your request, I will, with pleasure, endeavour, when in my power, to contribute to your excellent work, such matter as may comport with the subject which it embraces. But, Sir, I beg you not to expect much from my limited abilities. My last communication on the subject of cultivating our cotton crops, embraces a general account of the manner of cultivation throughout this section of country. I wish not to say too much, nor do I wish to be careless in my communications of any thing that may contribute to the general good of the community. Every man has an opinion which is guaranteed to him by sovereign right; he, in this is independent. Different men, differ in opinion on the same subject: permit me, therefore, to hazard an opinion with many others here, upon the subject of planting. We believe, that our crops when well cultivated do not produce as well, under the influence of bad seasons, as they do in good seasons, with indifferent cultivation. Hence we feel ourselves dependent upon favourable seasons, with good husbandry for favourable crops, and when both are suitably combined in excellence, we have excellent crops. These principles, I presume, will apply in Carolina and many other places, for on these depend the prosperous growth of the plant.

The early prospects of our present crops were uniformly and extensively flattering; they exhibited an appearance of unusual emolument to the planter; but, Sir, the result is, that vicissitude of season has produced vicissitude of crops. An early drought set in, and in many places continued upwards of ten weeks in succession. This unfavourable cause checked the growth of the plants, on all the suffering plantations. Some few plantations only were favoured with partial showers, their prospects were great; they flourished until a second untimely drought ensued, which the crops were not well constituted to sustain; the plants suffered and languished until their powers were much exhausted; consequently shed their forms abundantly and ceased to grow in as much, that no blossoms

appeared in such fields, for a considerable time after the picking was commenced.

The crop that suffered most in the early drought, sustained the latter drought much better than those did, which were favoured with early and seasonable rains. Some plantations in our vicinity were affected with spots of rust, from one to several acres in space, but this was not a general evil with us. Under the above difficulties, it was thought that the crops would turn out badly, but, Sir, on the contrary, they have produced much beyond expectation. At the early time of picking, the weather was warm and rainy, which continued five weeks in succession; this retarded the business, and injured the gathering and saving of the crops, which has been the cause of much loss. The crops were so much retarded by the second drought, that little or nothing was had from a latter growth. Our crops have, however, proved reasonably good. Some plantations have produced full and excellent crops, from which have been picked six, and rising six bales to the hand, averaging four hundred pounds to the bale. Some sections of land here, have produced between four and five hundred pounds of nett cotton per acre; this was from spots of superior land on some plantations.

We have great reason to bless the Great Giver of every good, he hath blessed us in his Providence. I wish Carolina equally prosperous.

With respect to the subject of silk, I have but little to say, when contrasting my knowledge of the business with those who are more experienced in the practical pursuit of it. But, inasmuch as may pertain to the general good of the community, permit me to "cast in my mite." I amused myself last spring with about two thousand silk worms: as usual with me, I fed them upon the leaves of the common black mulberry of the country. They grew to their general size, in excellent health and vigour. As they matured, they commenced spinning, and considering their situation, they did well. The cocoons which they made, were not generally as large as I had the year previous, which I think was occasioned by their being too much disturbed owing to their situation. The silk which they produced is of excellent quality, exhibiting a very bright and lively fibre. There is, however, a manifest difference in the finest and softness of the silk. Some of the cocoons are

more coarse and harsh than the others, this difference attracted my attention, and by inspection I discovered that the lightest coloured cocoons were the finest and softest silk. I have some large fair cocoons that are but a shade less than white; they uniformly are the finest and softest silk. This difference I cannot well account for, for they were produced by the same family of worms, were fed together on the same food, at the same time, and subject to the same vicissitudes. I can only admit that this difference in excellence is produced by worms of excellent constitutions; further, I submit to be corrected by my superiors on the subject.

When the cocoons were matured, I gathered them, and selected such as I intended for propagation; the rest were indiscriminately prepared for reeling: this I did in a very ready, simple and easy manner, by which the silk is much improved. In order to destroy the vitality of the chrysalides, I procured a tin box with a top cover which shut very close;—as I filled the box with cocoons, I sprinkled them with good spirits of wine, then closed the box tight, and set it in the sun. The heat soon evaporated the spirits, which when dissipated pervaded the whole cavity of the box, saturated the cocoons, and instantly suffocated the chrysalides. Thus, the vital functions of the insect were destroyed without languishing. This process may be performed every three hours with the same box, while there is a warm sun. The spirits act upon the animal gummy matter of which the silk consists, dissolves it and sets the fibre free; improves the silk by leaving it bright, soft and lively, and causes it to yield its fibres from the cocoon to the reel with the greatest freedom. Thus the process of reeling is performed with a facility unusually pleasing and profitable; for, by this process a much greater quantity of reeling silk may be obtained from the same cocoon, than is usually the case with the water-bath, and by baking, which are both tedious and injurious to the silk, and of course unprofitable. I have had a ball or cocoon to run over the floor, similar to a ball of yarn, while I held the fibre in my fingers. For the principle in the use of spirits of wine, as above stated, I refer to "Dr. Lardner's excellent book on silk manufactures."* To the application of

* Page 127, and Note v. page 261, Monsieur Bon.

the spirits of wine I have added camphor, which renders the process more immediately effectual, and is of much benefit to the cocoons, which are thus cured for market. Let objections (if any to this principle) be made. Thus, I have completed my principal design, in having obtained a knowledge of the nature, disposition and general properties of the silk-worm, and particularly so as concerns the congeniality of this climate with their health, and the quality of their silk. With this attainment, I am highly gratified. In faith, I believe, I am willing to hazard an opinion, so far as to say that, with a grove of the white, or any other mulberry suitable for the production of silk, a suitable building, with the necessary fixtures for the business, silk may be made in Louisiana and its vicinity, equal in quantity and quality to any other part of the United States. I trust, there are gentlemen sufficiently well acquainted with the climate of Louisiana and the propagation of silk-worms, to acquiesce, or otherwise make me sensible of an error in my opinion.

I further believe, that it may be made a business of profit to the man of small capital—that in three months of every year, a single person well acquainted with the business, may, with the aid of three small boys to gather leaves, &c., realize one thousand dollars in the product of labour from silk. I know of no business which I could more readily, and I think safely recommend to every honest man, whose purse contains but few dollars, and whose house is ornamented with many healthy and promising children. I think that any and every industrious man, who will cultivate a grove of mulberry trees, and obtain the other fixtures necessary, simply suited to the business, may realize three hundred dollars annually to every child of twelve or thirteen years of age, that is able to labour. Such an income would do much more than maintain a family with all the necessary comforts of life. As a commodity of commerce, silk has ever been, is now, and will ever be a cash article. And while human necessities exist, it will find a market, and command as ready a sale as cotton or any other raw material. Such emolument holds out strong inducements, and kindly invites the labouring part of the community into the silken garden, where, by their industry they may not only obtain

the common comforts of life, but with them may enjoy luxury. Hence, let honest industry dispel penury and distress. Let every rational man reflect, look into himself, and consider the end and aim of his existence, he will see that there is nothing wanting in his temporal concerns to render himself comfortable and happy, but prudent application and persevering industry with economy. He who will embrace these principles as a maxim of conduct, will not be under the disagreeable necessity of disgracing himself, by annoying his neighbour with,—"pray my good Sir, can you favour me with the loan of five dollars a day or so."

Accept the friendship of

J. B. BREWER.

ART. XXXIV.—*On the Culture of Rice on high land, Corn and Peas; by* GEORGE WILSON.

"Newbern, (N. C.) April 7, 1833.

Dear Sir,—Yours of the 27th of March is before me. I have made two small crops of rice as an experiment. The first crop was planted in drills three feet apart upon high, dry, sandy land that had been cultivated for a number of years in corn and cotton, and would have produced in corn, about ten bushels the acre. The rice was sowed in the drils at about the rate of a half bushel to the acre, during the middle of April, and covered lightly. It was afterwards cultivated with the plough and hoe in a similar manner as cotton. The season during its growth was favourable. When threshed and well fanned it yielded thirty bushels to the acre, and was disposed of in its rough state at forty cents a bushel. The second crop (this is my last one) was planted about the same time of the year as the first one, and about as thick in the drills upon low, wet land, just cleared. It did not grow so thrifty as the first crop upon the high land, owing probably to the land being

new and trashy. Some parts of it fired and came to nought. Upon the whole since it has been gathered and cleaned, I think it has yielded about equal to the first crop. Circumstances have prevented my measuring it. This crop I intend to clean, having erected a little machinery for the purpose. It is of the golden straw variety. I have, no doubt, but that this low land when properly reclaimed will yield sixty bushels to the acre. Low wet lands here called "savannahs," with clay foundations, have yielded this quantity. The crop requires about the same quantity of labour to make it as cotton. I have never planted it among corn, but have frequently seen it so planted. In a dry season upon high sandy land, I think it would fail. So prolific is it in breeding worms, that corn planted in the soil immediately after a crop of it, is sure to be eaten by them while young. The rice made here is heavier by three pounds in the bushel than yours, owing to our more northern climate.

In cultivating corn upon sandy land, I commence by breaking the soil intended for it, in February, not deep. Sandy land should never be ploughed deeply. When broken it is crossed at intersections of six feet square, and on the first of April planted with three grains in each hill. Afterwards if there is any missing hills, they are replanted. The field is ploughed over every fortnight, and hoed about the hills at least twice during its growth, and oftener if convenient. A hoeing at the time of thinning it, to two stalks in a hill, is indispensable, as is also a hoeing at the period of laying it by, to make a good crop. Four or five ploughings make the crop. My crop the past season averaged to the acre, three and one-eighth of a barrel of five bushels each.

In the centre of the squares of corn we plant, about the tenth of June, a hill of cow-peas, (ten or twelve peas.) If the land is freshly cleared, they yield a handsome return. If old, they yield but little. These we cultivate by simply keeping the grass from them. We do not hill them. We find them good food for both man and beast, and they ameliorate the soil by their shade. Sometimes they are sowed, and just before they blossom are ploughed into the soil to enrich it, with a very good effect. They are a valuable addition to the corn crop. Land much worn may be made to produce them again by manuring it. They do not look

so well upon the table, owing to their colour; but boiled until soft, with a piece of bacon, they are preferable to all the other species of the peas, except, perhaps, the garden peas while young. They are more productive than any other species, and have more gluten.

I have this spring carted and spread upon twenty-five acres of land, one thousand six hundred loads of manure, (three mules in a cart.) When not otherwise engaged, all my force is employed in bringing trash from the woods and throwing it into the horse stable and cowpens to make manure. By this means, in the course of the year, there is amassed a respectable supply to enrich the poorer spots of the farm, and it does enrich them wonderfully. By this process, these twenty-five acres have been brought from ten bushels to thirty, in two years, and my desire is to bring them to fifty.

Manuring is a partial remedy for emigration, the spirit of which is so prevalent here, that vast numbers leave us for Alabama, Tennessee, &c., where they expect to find richer soils. Probably they may, but when they come to count the cost of a breaking up and a removal, and in getting well settled again; many of them have gained but little, if any thing. Nor are they ever afterwards satisfied in having exiled themselves from their father-land. And what is money to a dissatisfied spirit? And if a struggle against difficulty is a virtue, it is virtuous to enrich a poor soil, and probably in many cases, it is also the best economy. Of these matters every one assumes the right to judge and decide for himself. May they do so with advantage to themselves. In the interim, North-Carolina is depopulating, and must, finally, be tenanted by her primitive occupants—beasts and Indians. Thus changes the world!

Respectfully,

GEORGE WILSON.

ART. XXXV.—*On the making of Raspberry and Strawberry Cordials, Cider and Wine; also, Observations on the growing of the Sugar Cane, in the lower part of South-Carolina; by* A SMALL PLANTER.

" St. Matthew's Parish, November 1, 1832.

Dear Sir,—In the *Southern Agriculturist* for October, I see you have published my essay of June last, " on fruit trees, making wine," &c. the greater part of which you, no doubt, perceived, was the production of haste; it was, Sir, the original which I intended to be revised, and transcribed previous to publication when I wrote it, and which should have been done but for lack of time. Feeling anxious to have it published prior to the expiration of the season of wine, and an opportunity offering, by which I could send it to the nearest post-office by a person who I knew would pay the postage; and having about two-thirds of it written, I sat to, and wrote the remainder by candle-light, in a very cursory manner, not even having time to apologize, nor to beg the favour of your critical correction, and so forwarded it to you " with all its imperfections on its head." It has made its appearance in print with a better face than I expected, but still with some errors, grammatical and arithmetical—the latter, I presume, is typographical, and perhaps the former; you have the manuscript and can decide.

One gallon of Raspberries or Strawberries when properly mashed, squeezed, and the juice mixed with the requisite quantity of water, sugar and brandy, will make one and a half gallons of rich beautiful cordial, having all the good qualities of Madeira wine. There is no loss in adding sugar to the fresh juice, as the quantity increased thereby, is of more value than the sweetening. Two years since, last July, I made a barrel of permanent cordial, like cider, without brandy. I took the pure juice of the ripest apples, sweetening it at the rate of half a pound of Muscovado sugar to the gallon, I took then an empty cask and after fumigating it well with the smoke of brimestone, I poured into it through a strainer about three gallons of the juice, then fumigated it again with the brimstone smoke, what the cask could contain, closed the bung, rolled the barrel backwards and forwards for the

purpose of impregnating the inclosed liquid with sulphurious fume; repeated the process of pouring in, fuming and rolling, till the cask was filled, then bunged it up tight, placing it where it would be kept steady and free from perturbation, not meddling with it till Chrismas, when I broached it, and better cider I never tasted. I never tried the experiment with any liquid but the juice of the apple: I expect the same process would succeed similarly with the juice of the grape or that of any other kind of fruit.

To convert the simple vinous juice of any fruit into an exhilirating salubrious cordial, without the admixture of other ingredients, is a great desideratum. This cannot be readily done, but by confining it in receptacles impervious to the atmosphere. The ancient Phœnicians, it was thought, made the best wine in the world; and their method was to fashion a green beef hide, in the most suitable manner for making a portable receptacle—closed it with seams impervious to the air, filled it with the *must*, then put it where it could be kept cool and unmolested. This, when complete, was called "a bottle of wine." The elastic quality of the green hide, renders it a useful substance for containing new wine, as it resists the impetus of its fermentation, which sometimes bursts glass, and forces the whizzing fume and liquid through the seams of the tightest casks. This, in my humble opinion, is the only method, by which good wine can be made in a warm climate, exclusive of artificial agency. And even this method was not always exempt from said agency, for the *must* intended for the first rate quality of wine, was boiled, mixed with honey and spiceries, bottled in the largest kind of hides, rested on its lees till the commencement of the cold weather of the second winter; when it was carefully racked off into smaller bottles made mostly of the skins of sheep and goats. I expect this was the manner of making the celebrated Nectar.

If fruit cider and wine are so estimable in a pecuniary point of view, they are more so as promoters of health, strength, and cheerfulness; as remedies for sickness and a preventative for many disorders. In the sickly districts of France and Germany, as I am credibly informed, the fever disappears at the approach of the vintage, although it is naturally the sickliest season of the year, and the

failure of fruit there is considered as a two-fold public calamity: for besides the loss of the staple commodity, sickness, if not pestilence, is pretty sure to follow. But why cross the Atlantic for instances when there is a sufficiency at home? The cider districts of the maritime parts of New-Jersey, Delaware, Maryland and Virginia, are naturally, perhaps, as sickly as any part of South-Carolina; but fevers there abate at the approach of the cider season, and diminish in proportion as it advances until they entirely disappear. Many of the farmers in those States dread a failure of fruit as they would the failure of harvest: indeed, the fruit of many of their farms is their most valuable production, witness that of Mr. Jones' of New-Jersey, (mentioned in one of your journals) which produces annually about seven thousand dollars worth of peaches alone, setting aside the valuable produce of his other fine orchards of apples.

The all-wise Author of nature in order to overbalance evil with good, has bountifully granted some benefit which commonly more than compensates for the natural disadvantages peculiar to any state or country. Thus in febrile regions the soil and the climate are capable of producing the cure and preventive. I know of nothing that would contribute more to the comfort and advantage of the citizens of this State, than the rearing of fruit, the cultivation of the sugar cane, and the valuable grasses, (such as the gama grass and the wild oats); the encouraging the introduction of valuable exotics, and the promoting the cultivation of valuable plants. We already have to promote the rearing of stock of every kind, and to prepare for the total abandonment of the culture of cotton, except for domestic use. The quantity of fruit-trees in this part of the State has greatly diminished since the commencement of the present century, owing to the emigration of the small planters whose plantations were mostly sold to great ones, who destroyed the orchards for the purpose of raising cotton on the gound where they stood, and to prevent the fruit being pilfered and carried off by the neighbouring negroes, for in some places it is an aggravating misfortune for a person to have an orchard. I have had nearly half of my apples stolen and carried off in the night. Was every planter in the State obliged to plant an orchard of apple and peach trees, of the early and late kinds in proportion to

the number of his slaves, say five trees of each for every one of his negroes. It would, I think, be the happiest obligation that South-Carolina was ever laid under.

When an agricultural article becomes a first rate staple, it seems difficult to abandon it, even when its culture proves to be entirely disadvantageous. The planters in the upper part of this State were a long time before they could be prevailed upon to substitute the rearing of cotton for that of tobacco, although the latter had become something worse than unprofitable, and they seem now to be similarly disposed not in the upper parts only, but all over the State.

And the cotton planters appear to be determined to persevere in its culture, although they should get nothing but their labour for their pains. Since the invention of the labour-saving machines for ginning and manufacturing, there are few or no productions of agriculture that are and have been more estimable on account of their utility than cotton, and there are few or none that have ever been known to have outgrown their demand so rapidly, and so completely, as what cotton has done. It seems as if all mankind were concerned and combined in promoting its production. Sixteen years ago there was no cotton exported from Virginia, Mississippi, Alabama nor Florida, and sixteen years ago, there was no cotton exported from Brazil, nor any of the South-American States, nor from the East-Indies, nor from Egypt; and these now are all great cotton-growing and cotton-exporting countries. Is it not then much more a matter of astonishment that cotton gets the price it does, than that it should be reduced to what it is?

I have reason to believe that the climate of the lower half of South-Carolina is more favourable to the growth of sugar cane than that of Louisiana. Being situated south-west of the Allegany Mountains, which wafts or wards off the north wind, and as it were, guards vegetation from the fatal effects of the chilling northern blast, and of the early killing frosts of autumn till the snow covers the mountains, which seldom happens till after Christmas.

On the contrary, Louisiana is much exposed; although located several degrees south of the parallel of Charleston,

yet her locality renders her much more northern than her latitude warrants. Situated near the mouth of one of the longest rivers in the world, which with its grand contributor, the Missouri, opens avenues to the frozen regions, from whence the northern winds having no obstruction to retard or bias them, descend upon her with unabating celerity, and often bring premature winter and extremely cold weather when least expected. The proximity of the Gulf of Mexico also facilitates the operations of old Boreas by its warm temperature and consequent rarifaction of the encompassing air, acts as a draft to the colder northern atmosphere, and brings down the breath of the frigid zone in a very short time.

I have read in a newspaper, (though in what paper I cannot now recollect,) that a captain of a vessel and his crew were frozen to death on Lake Ponchartrain, on the night of January 19th, 1817. From a circumstance that took place in my family, I remember the day perfectly well, it was on a Saturday, and a very cold day, but not so cold as many a one as we have had since. I frequently see accounts in the newspapers of the crops being injured in Louisiana by early autumnal frosts. In the year 1830, the damage was immense, supposed to be more than half of the sugar crop, occasioned by unseasonable frosts that happened in October and November. In that year, with us, or in this neighbourhood, there was no frost till the 1st of December, and that so light as not to injure vegetation.

Within a few years, in different parts of this district, I have seen several small patches of sugar cane, they all grew, flourished and matured beyond expectation: and I never knew a sugar cane to be injured by frost, previous to its being cut. Those that have been cut and put away for seed, have been injured by the cold; but the cause of that was ignorance of the right way of taking care of them.

A SMALL PLANTER.

ART XXVI.—*Account of an Agricultural Excursion made into the South of Georgia in the winter of* 1832; *by the* EDITOR.

(Continued from page 169.)

The island of "*St. Simons*" is remarkable for its healthiness, and the planters enjoy the great advantage of living constantly on their plantations, and superintending in person all of the operations. The character of the soil we have already stated to be, a light sand, and there is a greater uniformity on this island than we have noticed on any other. It is throughout extremely level, neither broken into hills and dales or intersected by swamps—in fact, there is, we believe, but one on the whole island, and that being at the head of a large creek, can easily be drained. The plantations, with one or two exceptions, are situated on the outer edges of the island, leaving the interior unoccupied, except by a growth of shrubs and scattering wood. This part which, no doubt, at one time was thickly wooded, has been so cleared, that there remains on a large portion but little else than shrubs and trees of a second growth, and unless care be taken in time to guard against the evil, the day cannot be far distant when the want of firewood will be sensibly felt.

We have already noticed the culture of cotton on two plantations, the general mode does not differ materially. Beds are made at the distance of five feet apart, large and flat, occupying nearly the whole of that space. The seeds are scattered over the tops of the beds, and the plants when thinned out are left at irregular distances, varying from eight to twelve inches, not in a line as is common with us, but occupying a width of from twelve to fourteen inches. The plough is in general use, the fields are hoed over from six to eight times in the season, care being taken in the two last hoeings to confine the operations to weeding, rather than to stirring or drawing up the soil, both of which are believed to occasion a droping of the pods and forms. In one of Mr. Couper's fields, we saw some very luxuriant plants, but the height of what we saw in most of the fields, would not, we think, average more than four feet. We saw much, which was below this. Except on a few plantations; very little labour has been

expended in the manuring of cotton, and we saw several fields which were evidently exhausted by the system pursued. The product per acre, varies from one hundred to two hundred pounds, but even this quantity is exceeded on some plantations in favourable years, and the average product of the whole island for 1832, was estimated at two hundred pounds.

The cotton on most of the plantations, if not all, is got out by Eave's gins, propelled by animal power. The quantity ginned per diem, is certainly considerable, and our planters would do well to ascertain whether they might not be advantageously introduced into this State. We are aware that they have been tried and abandoned, owing in all of the instances which we have heard of, to a difficulty in managing them. We are somewhat at a loss to conjecture in what this consisted, we saw several at work both on St. Simon's and on the Main, and there appeared nothing likely to occur, but what might soon be remedied by a common carpenter. It is, however, a fact, that they have been several times tried and abandoned on our sea-islands, and yet, in the lower part of Georgia, they are in common use and do gin a large quantity per day, as the statements furnished us, and which we give below, fully prove. We could give but an imperfect idea of the machine by a drawing, certainly not such a one as would enable a planter to have one constructed. We, therefore, content ourselves with merely stating that, according to Eave's original arrangement, the gin consists of two pair of rollers about thirty inches in length, (we state this from memory, not having measured them) placed obliquely one above the other. Each roller is confined to its place by several iron boxes placed at regular distances on wooden pieces corresponding in length to the rollers. Below each set are a number of curved wire teeth five or six inches long which serve to hold the cotton when thrown in, whilst at the same time the seeds are permitted to escape between them. Another piece of wood having also a number of wire teeth, nearly of the same length is fixed immediately in front of the rollers, and this piece is made so to move by means of a crank that its teeth pass between those below, and within a half inch of the rollers, taking the cotton at the same time and presenting it to them, and as there is a constant motion upwards and

downwards, the cotton is generally in such a state as not to choke the rollers.

These double gins have been found to be somewhat complicated, and recently gins with single sets of rollers have been made, which are found to be much more simple, and to gin more in proportion than the double ones. All are propelled by animal power, and the cog-wheel and pinion driving a band wheel, are used on all the places we visited. In the arrangement we saw nothing different from that in common use in this State, where animal power is used. The following notes furnished us by J. H. Couper, Esq. will, however, convey much useful information, both as to the mode of applying the power, and the proportions necessary for each part.

"The simplest and most common plan is to erect a 'gallows frame of three or four strong posts, connected at 'top by two large cross beams, that receive at their inter-'section the upper gudgeon of the king-post. Arms, as 'usual, are attached to the king-post, and four or five feet 'above them, in the place of the wheel, twelve or sixteen 'light arms are substituted, the ends of which are notched 'to receive a rope or a band of twisted cow-hide.

"The rope or band drives a drum-wheel on the same 'shaft with the band-wheels that drive the roller pulleys. 'The drum, band-wheels and gin, are contained in a small 'building adjoining the horse-walk. This arrangement 'has nothing to recommend it, except its original cheap-'ness and its simplicity. The exposure to the weather 'occasions a rapid decay in the king-post and frame: and 'the rope or band requires frequent renewal.

"When the plantation is extensive and two gins are re-'quired, it has been deemed advantageous to erect a build-'ing thirty-four to thirty-six feet square, two stories high. 'The first story is occupied by the horse-walk: in the se-'cond are the gins and moteing tables, and in the third or 'garret the fan or whipper, with a shop for turning rollers, '&c. This arrangement is undoubtedly the most com-'plete and durable; but the expense, forms an objection to 'its adoption except on extensive plantations. On this 'plan are the gin-houses at Carmen's point, Hamilton, 'estate of Butler, Dr. Tunno's, and at this place.

"A medium system is that, when the horse-walk is con-'tained in a cheap building, and the gins and other ma-

'chinery in a small one adjoining. The building to con-
'tain the horse-walk is made by placing lightwood or oak
'posts in the ground, with an inclination inwards, to coun-
'teract the outward pressure of the rafters. The rafters
'are secured to the tops of the posts by mortices and ten-
'nons, and are suited in the same way to a centre-post.
'Two strong beams, at right angles to each other, are let
'down on the heads of two of the posts; they serve to brace
'the shed and receive the gudgeon of the king-post. The
'double roller gin has two pair of rollers, and is Eave's
'original arrangement. Within a few years, Mr. Pottle,
'of St. Mary's, in this State, has substituted two single
'roller gins for the double one. He places them back to
'back, forming an angle with each other, and both are
'driven by the same band-wheels, which are placed above
'and between them.

"The arrangement is simple and cheap: and four rol-
'lers, or two pair on this plan, gin out more cotton than
'the same number in the double gin, when they are placed
'over each other, in consequence of the seed from the
'upper pair falling between the cotton and rollers of the
'lower, and preventing the cotton being seized by the
'rollers. Mr. Pottle's gins are very highly esteemed and
'are much used. He has great practical skill: and is
'very moderate in his prices. He is in the practice of
'furnishing the propelling machinery on the most sim-
'ple plan, and attends to the erection of the whole.—
'Neither his machinery nor workmanship are of the best
'kind, as he studies cheapness and simplicity: but on the
'whole he may be recommended to your correspondents.

"The proportions of the various wheels admit of a great
'variety of modifications. The essential points are to gin
'from six hundred to eight hundred revolutions of the rol-
'lers per minute, one hundred and twenty-five strokes of
'the feeding arm, and from twenty-five to thirty revolu-
'tions of the fan in the same time. My brother has gone
'as high as eight hundred revolutions: our velocity here is
'six hundred. I am about increasing it to eight hundred.

"A double roller gin with six hundred revolutions
'average thirty bushes of seed, or six hundred pounds of
'clean cotton per day. I have averaged seven hundred
'and twenty pounds for twenty-two consecutive days. I
'obtained one day nine hundred pounds. My brother

'averages from four hundred to five hundred pounds per 'day with a single roller gin, having eight hundred revo-'lutions per minutue.

"I can recommend Mr. Ball, of New-Haven, Connec-'ticut, to such, as the maker of the best single roller gins 'that I have seen. The power required to drive one 'double gin and fan, will be from two to three good horses. 'With the gin alone, two horses will be sufficient. The 'hands required will be, boys to drive the horses, a feeder 'for each gin, a hand at the scaffold, a girl to bring and 'and take away the cotton, and a girl for the fan or whip-'per. The occasional attendance of a carpenter to make 'rollers is also necessary. Total, three boys and three 'girls, all one-quarter hands, and one full hand, equal to two 'and a half full workers to six hundred pounds of clean 'cotton.

"When the cotton of the estate of Butler was separate-'ly quoted as a superior article, it was ginned entirely by 'Eave's gin, as were generally the cottons of St. Simon's.

"This gin has been in use on St. Simon's Island for 'nearly forty years, and is now in very common use in 'this and the adjoining counties."

The following proportions for the several wheels have been found most effective. They are also furnished by Mr. Couper.

Bevel-wheel 14 feet diameter and 240 cogs. To the king-post, of which are fixed arms for attaching the horses; the point of attachment to be 15 feet from the centre of the king-post.

Bevel-pinion 34 cogs.

Spur-wheel 8½ feet diameter and 108 cogs.

Spur-pinion 1 foot diameter and 13 cogs.

Band-wheel, driving pulleys on the rollers, 3 feet diameter.

Pulleys 5½ inches, on rollers of from $\frac{6}{8}$ to $\frac{7}{8}$ inches diameter.

Band-wheel, which drives the wheel to which the crank is attached, 24 inches diameter.

Band-wheel, to the shaft of which the crank is fixed, 26 inches diameter.

The band-wheel which drives the pully of the fan or whipper, 2 feet diameter; the pully 1 foot diameter.

Having these proportions, the velocities will be as follows:—the rollers will revolve 383⅓ times for each revotion of the large cog-wheel. The feeding arms will strike

62½ times, and the fan arms revolve 14 times. If the horses go twice around per minute, these velocities will be 766⅔–125 & 28, which are the proportions to be observed.

At Mr. Gould's, on the south end of the island, we saw one of these gins worked by means of the wind, and by which he got out the whole of his crop. For this purpose he erected a light circular building, fourteen feet diameter at the base, and twelve feet at the top—the height sixteen feet. The whole made of light scantling, shingled from the bottom to the top, and so constructed as to move on a pivot, and be turned around by a lever so as to face any quarter the wind blows from. Near the top an axle is fixed which projects beyond the building on one side, and has the arms attached thereto: these are placed at an angle of twenty-two degrees, and are fourteen feet long; the sails are made of oznaburgs, using four breadths to each sail. To the axle within the house, is fixed a large band-wheel ten feet diameter, from which a band proceeds to the whirl fixed on the gin, which sets the whole in motion. The whole building with its fixtures is extremely light. It is true, that it is not always it can be worked, as the winds are the propelling power, but there is no great loss sustained by this, as a boy alone attends to it, spreading the sails, bringing the cotton, ginning and carrying it away. When the wind blows fresh another boy is sent to assist in bringing and removing the cotton. When in operation a bag is ginned in nine hours.

Corn and potatoes are not productive on this island, owing, it is supposed, to the dryness of the seasons and lightness of the soil. We think, however, that this might be greatly remedied by the application of marsh-mud and marsh-grass to the fields. Both of these have been found highly beneficial to such crops, not only on our islands, but also on the main. We know of no manure which causes a greater production of potatoes than marsh cut green, and carried to the cowpen, from whence it is to be removed after it has been well trampled and mixed by the cattle, and become partly decomposed. That it is not the manure obtained from the cattle which causes this effect, will be made evident to any one disposed to test it, by manuring a small spot with green marsh after it has served as a litter for cattle, and another spot, with what is usually employed in the cowpen. It will be found that the first is much

the most productive. The marsh may be used without being carried into the cowpens at all, it will not prove as efficacious, but still will be very excellent. It should, however, if possible, be in a partly decomposed state, which is effected by keeping it in very large heaps—when in small heaps it dries without rotting, or only a small portion of it rots. When applied before the texture has become at all broken, the decomposition goes on slowly, especially in sandy soils, unless it be a moist season. For slip potatoes it has proved excellent, and one great advantage is that if followed by corn, the succeeding year no manure need be used. When the object is to improve the texture of the soil, mud ought to be applied. Directions for doing this are to be found in several of the Numbers of this Journal, and need not be here repeated.

At Mr. Couper's, we saw a very flourishing plantation of young olive trees, containing about two hundred.—They appeared to be very vigorous, are from ten to fifteen feet feet high, and several of them have borne fruit for three years. A small quantity of oil was made from some of them, but the fruit has generally been pickled. We had the pleasure of eating some and found them excellent. These trees were nearly, if not all, imported from France several years ago, and have been found to stand our climate admirably, not being at all injured by the excessive cold of the two last winters. Nearly all the attempts made to propagate the olive, here, by cuttings, have proved unsuccessful, and this has been the case with all others of which we have heard, and we know of several. This appears somewhat strange, when it is known that in Europe it is propagated with the utmost facility. "It is multiplied by all modes that are in use for the propagation of trees, by sowing the seed, by layers, by slips, by cuttings of the root, and by sprouts separated from the trunk, or from the roots of the parent stock."* And it is said moreover, "that if a bit of the bark with a thin layer of wood is buried in the earth, it becomes a perfect plant."† Yet, in America, all of these modes have been tried and failed, or so little success has attended them that the culture of the olive is not likely soon to become a favourite. There is no doubt but that it would prove very

* Essay on the History and Cultivation of the European Olive Tree.

† Ibid.

profitable, and young trees might readily be procured from France—to commence with at least. It might prove too expensive to form a large plantation of imported trees, but in that case, should we still be unable to discover some mode of propagation, the seeds might be planted, and when the young trees have become large enough, they might be grafted, and in due time, removed from the orchard to the plantation.

In France it is usual to separate the stones from the pulp, after which they are clensed in an alkaline solution, and sown in a sheltered situation in March, in trenches, two or three inches deep, and covered with earth. "The young plants appear in October and continue to vegetate through the winter. By the following spring the most thriving among them will have attained the height of thirty inches. The feebler stocks should now be eradicated. With proper attention and in favourable soil, the remainder will be four or five feet high, and six and seven lines in diameter in the course of the third spring, with a perpendicular root of thirty inches. This is the season for transplanting them. Great care should be bestowed upon the preparation of the ground, and the young plants should be placed three feet apart. After two years they will be sufficiently advanced to be grafted, and at the end of five years they may be transplanted to the olive-yard. To accelerate the germination, the stones may be kept in fine mould during the summer and autumn, and sown in the beginning of January. They soon begin to vegetate, and before the following winter the young stocks acquire strength enough to support its rigours, while the tender plant which comes up in October is in danger of suffering by the lightest hoar frost."

The only experiment we know of in this country to raise olives from the stones, was made by Mr. Couper, the account of which is contained in the following extract of a letter received from him a short time since.

"In the fall of 1831, I put some olives under a press 'and made a little pretty good oil; a part of the seeds or 'stones I drilled in rows about as thick and covered as 'deep as we do peas—none came up. I had, indeed, 'given them up and the patch was covered with crow-foot 'grass, when a few days ago, my gardner informed me 'they were coming up, I had the grass drawn out and find

'them rising as thick as peas do. This experiment shows 'the facility with which any quantity of olives may be 'raised from seed."

It was with feelings of deep regret that we here witnessed the destructive effects of the winters of 1830, '31 and early part of '32, on what had been a most luxuriant grove of orange trees. It had occupied a space of twenty-two acres, regularly planted in squares, and bordered with sour orange trees. We do not recollect the age of these trees, but they had arrived at a bearing state, and had produced one most abundant crop and bid fairly, liberally to reward all the care and labour bestowed on them, when the cold of these winters completely blasted all expectations, destroying most of the trees to the roots and some entirely. We walked through the grounds where this splendid grove once flourished. Some few of the trees were standing, but in a wretched condition. Most of them had, however, been cut off near to the ground, and were sending out vigorous shoots, which may hereafter restore the beauty as well as the profit of the place. The grove was bordered, as we have already observed with sour orange trees, and there were several walks formed by them, which in summer must have been very pleasant, as their tops met or nearly met, affording a delightful shade to those who might promenade through them.

Mr. Clarke, in a communication, published in the fourth volume of this Journal, (page 19) objects to the use of sour orange trees for border screens to sweet orange groves, and states among other reasons that they are not more hardy than the sweet orange, whilst they are certainly injurious to them, and mentions several instances of this injurious effect. It appears to us, that the positions assumed by Mr. Clarke are correct, especially in the deleterious effects on all future groves formed from seedling trees. But from what we witnessed at Mr. Couper's, as well as in this city, we are inclined to think he has been rather too hasty in supposing the sweet orange as hardy as the sour. In this grove not a single tree of the sweet oranges escaped uninjured, and most of them were so severely so, as to induce Mr. Couper to cut them down to within a foot or two of the surface. Yet, the avenues of sour orange trees suffered *comparatively* but

little. The manner in which these avenues are formed, is worthy of a passing remark—the trees are in two rows separated *about* eight or ten feet. They appear to be from seeds drilled in the rows, and left as they came up without any being removed, consequently are extremely thick, varying from six inches to two feet. Yet, notwithstanding this contiguity, they are fine looking trees from fifteen to twenty feet high.

We here saw several date trees, one of considerable height—it is a female and more than twenty-five years old, blossoms annually, but bears no fruit. Several others are in progress, and perhaps, when these shall arrive at a proper age, fruit may be produced, though this is extremely doubtful as the leaves are injured by the frost. At Dr. Grant's (on this island) we saw about forty of them in one of his gardens, they had never done well only one had borne fruit and that but once. We also saw the black pepper *(piper nigrum)* growing in the open ground in a vigorous state, it was covered up for the winter, and we could not, therefore, have a full view of it. It had grown, we suppose, three or four feet high, and appeared to be in good health. We believe it has never borne fruit, or not more than a few berries, owing to its having been injured by the severities of the preceding winters. From what we understood from Mr. Grant, we are inclined to believe it might be made, with a little care, to produce fruit.

At Mr. Couper's we saw the best collection and the finest vegetables we met with in this excursion. His turnips and cabbages were very fine, and one of the beds of cauliflowers was superior to any we had seen any where that season, some were fit for the table and the remainder promised well. There was one thing we noticed worthy of general imitation, which was a spot of ground planted with cabbages and cauliflowers expressly for the negroes,—(turnips being supplied from the general crop.) These were as well attended and as well grown as those in the private garden, nor were the cabbages of the large coarse varieties, but on the contrary, such as were planted for the use of the family. The patch was surrounded by a common rail-fence sufficiently high to prevent cattle from getting in.

(To be continued.)

PART II.

SELECTIONS.

Art. XXX.—*Vegetable Physiology.*

[FROM LINDLEY'S GUIDE TO THE ORCHARD AND KITCHEN GARDEN.]

(Concluded from page 177.)

The next subject of consideration is *the mode of multiplying* improved varieties of fruit, so as to continue in the progeny exactly the same qualities as existed in the parent. Unless we have the power of doing this readily, the advantages of procuring improved races would be very much circumscribed; and the art of horticulture, in this respect, would be one of the greatest uncertainty. The usual mode of increasing plants, that mode which has been more especially provided by nature, is by seeds; but, while seeds increase the species without error, the peculiarities of varieties can rarely be perpetuated in the same manner. In order to secure the multiplication of a variety, with all its qualities unaltered, it is necessary that portions should be detached from the original individual, and converted into new individuals, each to undergo a similar dismemberment, with similar consequences. It happens that while in animals this is impracticable, except in the case of polypes, the system of life in a plant is, of all others, the best adapted to such a purpose. We are accustomed to consider individual plants of exactly the same nature as individual animals: this is, however, a vulgar error, which is dissipated by the slightest inquiry into the nature of a plant. A plant is really an animated body, composed of infinite multitudes of systems of life; all, indeed, united in a whole, but each having an independent existence. When, therefore, any number of these systems of life is removed, those which remain, as well as those which are separated, will, under fitting circumstances, continue to perform their natural functions as well as if no union between them had ever existed. These systems of life are buds, each having a power of emitting descending fibres in the form of roots, and also of ascending in the form of stems. The first of these buds is the embryo; the others are subsequently formed on the stem emitted by the embryo. As these second-

ary buds develope, their descending roots combine and form the wood, their ascending stems give rise again to new buds. These buds are all exactly like each other: they have the same constitution, the same organic structure, and the individuals they are capable of producing are, consequently, all identically the same; allowance, of course, being made for such accidental injuries or alterations as they may sustain during their subsequent growth. It is upon the existence of such a remarkable physiological peculiarity in plants, that propagation entirely depends; an evident proof of which may be seen in this circumstance. Take a cutting of a vine consisting only of the space which lies between two buds, or an internodium, as botanists would call such a piece, and no art will succeed in ever making it become a new plant, no matter how considerable the size of the internodium may be.* But, on the other hand, take the bud of a vine without a portion of the stem adhering to it, and it will throw out stem and root, and become a new plant immediately. If we examine the various modes employed in horticulture for propagating plants, we shall find that, however different they may be in appearance, they all consist in the application of these principles under various forms. It will be most convenient to consider these methods separately.

Propagation is effected by the arts of *Increasing by Eyes*, *Striking from Cuttings*, *Laying*, *Budding*, *and Grafting*.

Increasing by Eyes is the simplest of all these methods: it consists in nothing but extracting a single system of life, or a bud, from a given plant, placing it in due heat and moisture, and surrounding it with fitting food, and thus causing it to grow as a solitary individual, instead of as one of the community to which it originally belonged.

Striking from Cuttings is a slight modification of the last method. Instead of taking a single bud, a stem containing two, three, or more buds, is placed in circumstances fitted for the maintenance of its life. In this case, the chances of success are increased by the additional number of buds which are the subject of experiment. That bud which is the nearest the bottom of the cutting emits its roots at once into the earth, and so establishes a communication between the general system of the cutting and the medium from which its food is to be derived. The other buds, by pushing their stems upwards into light, attracts the nutriment absorbed by the roots, and so stimulate the latter to increased action. Ultimately, the roots of all the buds descend between the bark and the wood until they reach the earth, into which they finally pass, like those of the first bud.

* This is, of course, said without reference to the power which some plants possess of developing latent buds,—a subject which is foreign to the present inquiry.

There is another circumstance which renders the operation of striking plants from cuttings less precarious than from eyes. In both cases, the buds have, at the outset, to feed upon matter in their vicinity, until they shall have formed roots which are capable of absorbing food from the earth; but in the eyes, the nutritive matter can exist only in such portions of the stem as may have been cut away with themselves; while, on the other hand, in cuttings, the stems forms an important reservoir of nutriment. This is a consideration, the practical importance of which will be obvious to every cultivator. As it is from the buds alone of cuttings that roots proceed, it follows, that in cases of difficulty, when plants strike unwillingly, any thing which may facilitate the immediate introduction of roots into the soil will be advantageous. It is for this reason that a good operator always takes care, that the lower end of his cutting is pared down as close to the base of a bud as may be practicable without actually destroying any part of the bud itself; by this means the first emitted roots, instead of having to find their way downwards between the bark and wood, strike at once into the earth, and become a natural channel by which nutriment is conveyed into the general system of the cutting.

Laying is nothing but striking from cuttings that are still allowed to maintain their connexion with the mother plant by means of a portion at least of their stem. Where roots are emitted with great readiness, simply bending a branch into the soil, leaving its points above ground, is sufficient to ensure the success of the operation; but in cases of difficulty other expedients are resorted to, all which will still be found to have reference to the emission of roots by buds. One common practice is, to head down the branch that is laid into the earth; this is to called into action the buds below the incision, by stopping the general axis of developement. Another method is *to tongue* the layer, that is, to split the stem just up to the origin of a bud; a practice that has the effect of enabling the roots to be emitted into the soil through the wound more readily than if they had to pierce through the bark: the resistance offered to their passage through the bark is in many cases so great to compel them to continue to make wood rather than to appear in the form that is necessary for the success of the cultivator.

Budding and *Grafting* are operations that equally depend for their success upon the property that buds possess of shooting ing roots downwards and stems upwards; but in these practices the roots strike between the bark and wood of the stock, instead of into the earth, and form new layers of wood instead of subterranean fibres. The success of such practices, however, depends upon other causes than those which influence the growth of cuttings. It is necessary that an adhesion should take place between the scion and the stock, so that when the descending

fibres of the buds shall have fixed themselves upon the wood of the stock, they may not be liable to subsequent separation. No one can have studied the economy of the vegetable kingdom without having remarked that there is a strong tendency to cohesion in bodies or parts that are placed in contact with each other. Two stems are tied together for some purpose: when the ligature is removed, they are found to have grown into one: two Cucumbers accidentally placed side by side, or two Apples growing in contact with each other, from double Cucumbers or double Apples; and most of the normal modifications of the leaves, floral envelopes, or fertilizing organs, are due to various degrees of cohesion in contiguous parts. This cohesion will be always found to take place in the cellular tissue only, and never in the vascular tissue. In the stems of all such trees as are grafted by orchardists, the cellular tissue is found alive only in the medullary rays and the liber; it is therefore essential, in the first place, that those parts, both in stock and the scion, should be placed in contact. In regard to the medullary rays, these are so numerous and so closely placed that it is scarcely possible that a portion of one stem should be applied to another without the medullary rays of both touching each other at many points. No care, therefore, is required to ensure this, which may be safely left to chance. But in regard to the liber, as this is confined to a narrow strip in both stock and scion, great care must be taken that they are both placed as exactly in contact with each other as possible, so that the line of separation of the wood and bark should, in both stock and scion, be accurately adjusted. The success of grafting depends very much upon attention to this. But there are other reasons why this accuracy in adjusting the line between the bark and wood of the stock and scion is so important. It is at that part that the roots of the latter pass downwards over the former; and it is also there that the substance called *cambium*, which serves as food for the young descending fibres, is secreted. It is obvious, that the more accurate the adjustment of the line separating the wood from the bark, the more ready will be the transmission of young fibres from the one to the other; and that the less accuracy that may be observed in this respect, the greater the difficulty of such transmission will be. Provided the stock and scion be of exactly the same size, the adjustment can scarcely fail to be accurate in the most unskilful hands; it is in the more common case of the scion being much smaller than the stock, that this is to be most particularly attended to.

Budding differs from grafting in this, that a portion of a stem is not made to strike root on another stem, but that, on the contrary, a bud deprived of all trace of the woody part of a stem is introduced beneath the bark of the stock, and there induced to strike root. In this operation no care is requisite in securing

the exact contact of similar parts, and a free channel for the transmission of the roots of the bud between the bark and wood of the stock; for, from the very nature of the operation of budding, this must of necessity be insured. The bark of the bud readily coheres with the wood of the stock, and secures the bud itself against all accident or injury. But if precautions of the same nature as in grafting are not requisite in budding, others are of no less moment. It is indispensable that the bud which is employed should be fully formed, or what gardeners call ripe; if it is imperfectly formed, or unripe, it may not be capable of that subsequent elongation upwards and downwards upon which the whole success of the practice depends. Secondly, that great care should be taken, in raising the bark of the stock for the insertion of the bud, that the cambium be not disturbed or ininjured. The cambium is a secretion between the wood and bark, not only destined to support the descending fibres of the buds, but also to generate the new cellular substance within which the descending fibres are finally found imbedded. If, in the preparation of the bark for receiving the bud, this cambium be injured or disturbed, it becomes much less capable of affecting the cohesion that is necessary, than if uninjured. In budding, therefore, the bark should be carefully *lifted up*, and not forced from the wood with a bone or metal blade, as is usually the case; for although it is no doubt true, that an operation clumsily performed will often succeed, yet it should be remembered, that if skilfully managed it would be attended with much more perfect success; and that a habit of constantly operating with delicacy will enable a gardener to succeed with certainty in cases in which a bungling practitioner would be sure to fail. Little do those who crush with rude hands the tender limbs of plants, reflect how delicate is that organization upon which the life of their victim is dependent.

Transplanting is, perhaps, that operation in which the greatest difficulty is generally found to exist, and in which the causes of success or failure are often the least understood. Volumes have been written upon the subject, and the whole range of vegetable physiology has been called in aid of the explanation of the theory; yet I am much mistaken if it cannot be proved to depend exclusively upon the two following circumstances: 1. *The preservation of the spongioles of the roots;* and, 2. *The prevention of excessive evaporation.*

It is well known that plants feed upon fluid contained in the soil, and that their roots are the mouths through which the food is conveyed into their body. But the absorption of fluids does not take place either by all the surface of their roots, nor even of their fibres, but only by the extremities of the latter, consisting of bundles of vessels surrounded by cellular tissue in a very

lax spongy state, whence those extremities are called spongioles. That it is only through the spongioles that absorption to any amount takes place, is easily shown by growing a plant in water and alternately preventing the action of the spongioles, when langour and a cessasion of vital action comes on, and preventing the action of the general surface of the roots, leaving the spongioles at liberty, when the vital energies are immediately renewed. These spongioles are exceedingly delicate in their organization, and a very slight degree of violence destroys them. It is scarcely possible to remove the soil from the roots without injuring them in some degree; and if transplantation is effected violently or carelessly, they are in a great measure destroyed. In proportion to the size or age of a tree, is the difficulty of preserving them increased; and hence at the same time the difficulty of transplantation is augmented. If, by any method, the spongioles could be preserved unharmed, there would be no reason whatever why the largest forest tree should not be removed as easily as the young plants in a nursery; but their preservation in such cases is impossible, and therefore the transplantation of trees of great magnitude cannot be effected. It is because of the security of the spongioles from injury when the earth is undisturbed, that plants reared in pots are transplanted with so much more success than if taken immediately from the soil. Hence, also, when earth is frozen into a huge ball around the root of a plant, transplantation is effected with the same kind of certainty. The practice of cutting the roots of large trees the year previous to removing them is attended with success for a similar reason. Wherever the roots are cut through, the new fibres which are emitted, provided a plant is in health, in short tufts, and each terminated by a spongiole, are much more easily taken out of the ground without injury than if they were longer and more scattered among the soil. When destroyed, the spongioles are often speedily replaced, particularly in orchard trees, provided a slight degree of growth continues to be maintained. This is one of the reasons why trees removed in October succeed better than if transplanted at any other time. The growth of a tree at that season is not quite over; and the first impulse of nature, when the tree finds itself in a new situation, is to create new mouths by which to feed when the season for growing again returns.

Evaporation takes place in plants to an inconceivable degree in certain circumstances. It is known by the experiments of Dr. Hales, that a sunflower plant will lose as much as 1 lb. 14 oz. by perspiration in twelve hours; and that in general, "in equal surfaces and equal times, a man would perspire 1-50, the plant 1-165, or as 50: 15;" and that taking all things into account, a sunflower perspires 17 times more than a man. The same most accurate observer found that a cabbage perspired in twelve hours 1 lb. 9

oz.; a Paradise Stock in a pot, 11 ounces; and a Lemon Plant, 8 oz. Guettard states that he found Cornus Mascula perspire twice its own weight in a day; and Mr. Knight has remarked a Vine in a hot day losing moisture with such rapidity that a glass placed under one of its leaves was speedily covered with dew, and in half hour the perspiration was running off the glass. In damp or wet weather this evaporation is least; in hot dry weather it is greatest. This loss has all to be supplied by the moisture introduced into the system by the spongioles; and hence, if the spongioles are destroyed, and evaporation takes place before they can be replaced, a plant must necessarily die. This is the reason why deciduous trees cannot be transplanted when in leaf; it is impossible to remove them without injuring their spongioles, and it is equally impossible to hinder the evaporation by their leaves: but if they are kept in pots, it matters not at what season their removal takes place, because as their spongioles are then uninjured, even excessive evaporation would be made good by their action. It is well known that certain evergreens, such as Hollies, Laurels, &c. can be transplanted in almost all months; this arises from their perspiration being much less copious than in deciduous trees, wherefore the spongioles have less difficulty in supplying the loss occasioned by it; yet even evergreens cannot be removed in the hottest months in the year, because then the action of such spongioles as may be saved in the operation would not be sufficient to supply the waste by evaporation.—Plants first beginning to grow in the spring, with their leaves just turning green, are in a most unfit state to remove; for, when transplanted, their roots will not have time to form a sufficient number of new spongioles to supply the loss to which the rapid perspiration by the leaves at that season will give rise. It is upon this same principle, that if deciduous plants are taken from the ground in the summer, they are put into pots and placed in a hot-bed to recover; not for the sake of the heat, but because the atmosphere of a hot-bed is so charged with humidity that perspiration cannot go on, so that the vital energies of the plant, instead of being wasted by evaporation, are directed to the formation of new mouths by which to feed.

This is but a brief outline of what the principles are, upon which the common operations of the fruit Garden depend; yet it is hoped that it may not be without its use in calling attention to the rationalia of what may seem extremely simple and well-understood practices, but which are undoubtedly neither so perfect, nor generally so skilfully performed, as to be incapable of amendment.

Art. XXXI.—*Cultivation of Bees.*

[FROM THE GENESEE FARMER.]

(Continued from page 212.)

It will be seen that, although the hives I have used are different, the plan is essentially the same; being that of keeping them in one great community, and preventing their spreading by swarms. That the same number of bees are easier and less expensively managed in this than by the ordinary method of swarming in small hives, I fully believe; and were I perfectly sure that they will increase as fast in this manner of keeping them as in the common way, I would say that is decidedly the best plan that I have ever known. That it is better than to kill the bees to take the honey, I am well convinced, as they can certainly be of no further benefit in such case.

The only question of which I have any doubt is, whether as many bees will be produced in one large hive, holding a number, say equal to ten swarms, as may be produced from as many distinct swarms in separate hives. I know of but one objection, and that is only known to me as a debateable one, to wit: it is asserted by many, and perhaps generally, that there is in every hive, after being properly organized, but one queen, or mother bee; that that queen is the *female*, and of course the *only female*, and propagator of bees in the hive; that such female can produce and lay out but a limited amount or number of eggs; that the number laid by each female, in the ordinary hives, will throw off from one to three swarms per annum, besides making good the number lost by death and other accidental causes. Now, if such be the fact, that is, only one propagating bee residing in a hive, when such hive has increased to such a number as that it will require all the progeny of the mother bee to supply the annual loss to the hive, the number inhabiting such hive cannot therebe increased to any further extent.

This question, relative to their being but one female in the hive, I have said is a debateable one; and some even go so far as to deny the existence of a queen bee at all. Dr. Smith, to whose treaties I before alluded, doubts the fact, although the bee, which others called the queen, has been shown to him. I have now three dead bees in my possession, which were given to me by an experienced bee keeper in Buffalo, which he says are queens. He found them in front of a young swarm of his that had just been hived, and said that the workers had but an hour before drawn out and disposed of them. One was not dead when he brought it to me. They were certainly very different in their appearance from common bees, or from drones, being long and slender in their bodies, and having yellowish legs. These bees also had eggs in them, as I found on examination. I think upon

the whole, there can be little dispute of the fact upon which the great majority of opinion is agreed. Now does there exist more than one queen in a hive? If not, then a swarm cannot be increased beyond a certain number. But if more than one queen can, or does exist in a hive, or a queen be apportioned to a given number of working bees, I can find no objection to confining almost any amount of bees to one community.

To this problem I shall be pleased to receive an answer from any gentleman of observation through the columns of the Genesee Farmer, and although the question may not be so generally important, nor elicit such general observation as the article of chess has of late, still it is an important one in the matters of rural economy, and not less so to natural history.

I have read many accounts of bees which were kept in garrets, eaves of houses, &c., but the accounts of their particular management have been so loose, that I have been unable to form any distinct *data* to govern my own conduct towards them. Some anecdotes have been published in the first volume of this paper, from Boston, Kentucky, Ohio, and elsewhere, relating to their management, which have interested and pleased me; and all these accounts, more and more convince me that much is yet to be learned of the proper management of these useful insects, the best way of which appears to be, to obtain the greatest quantity of honey from a given number of bees without destroying their lives.

Advantages of the Box Plan.—If I meet with no accident, I intend keeping my swarms together, and all in one community; so long as I am able to do so. If my present hives get too full, I can build larger; and in one season drive them all into it. I am satisfied that a swarm of bees can collect honey and bread enough in two months of the honey-making season, to support them through the winter. If they have sufficient room, they will work so long as they can find materials, and of course, the more room they have, if properly arranged, the more honey they will make. The bees are by this method kept together: they are strong, powerful and fearless; able to repel any invasion, and to afford themselves complete protection. They are thus more easily managed than when in separate hives; and when kept in a sheltered, tight building, and a dark one too, which ought always to be the case, an equal temperature prevails among them, keeping them more healthy and regular. Darkness is, besides, more natural to them when at rest that light; and it affords also less opportunity for attacks from other insects and vermin. There is, too, much labour always performed by every swarm of bees, in glueing up the open joints and cracks in their hives; of course, if few joints exist, the less such waste labour they will have to perform. The labour of seeking out new habitations, and all the nameless matters of preparation for

removal of young communities is saved; each young bee, as it emerges into life, having nought to do but take its place among the ranks of the hive and commence its round of duty. This last advantage I conceive a very great one, as much time and pains is often consumed in preparing their habitations, and guarding against the rigours of the climate. They are not at all liable to be robbed when in such large communities, and are always safer from depredations than smaller tribes.

Some writers have gone so far as to say, that the bee moth or worm would not disturb them when placed in a dark and high garret. This I have found not to be so. There have been many worms in and about my hives, but no injury has been sustained by them. I have watched them pretty narrowly, and destroyed many, yet they were continually there, and they breed with a rapidity that surprised me. Owing, I presume, to the great population of the hive, they could not effect a lodgement within them, and were therefore unable to do them any harm. I often caught worms and laid them near the mouth of the hive. One or more bees would forthwith seize it in great anger, and carry it completely out of the building, and fly off with it to some distance before it was dropped. I know of no better way to dispose of these troublesome insects than to watch and destroy them as opportunity may offer.

Bees managed in this way may be kept in the midst of the largest towns and cities. One of my hives stands in the most populous and compactly built part of the town, surrounded by high brick buildings. There are always some gardens in the neighbourhood; and they can easily range the fields out of town to obtain their food. Besides this, they search every store and house in the vicinity, and the grocer's sugar, honey and molasses casks receive abundance of their visits, from the refuse of which they gather much treasure. While on their excursions of labour they are perfectly docile, never attempting to sting unless assaulted, and even then more disposed to leave the ground than retaliate.

Description of the First Hive.—The hive is six feet long, sixteen inches wide in the clear at top, twelve inches at bottom, and one foot high; with two partition boards, making three rooms, with an open communication to each, and all having openings to the lighting board in front.

The top board of the hive is six feet long and eighteen inches wide, with a hole, three inches in diameter, over the centre of each room, through which the bees can pass when a box is placed over the top to collect honey. There might be two passages over each room, if small boxes were used.

The front of the hive is six feet long and twelve inches wide, with small openings at the lower side for the bees to pass through, six inches long by three-eighths of an inch high.

The back board of the hive of the same dimensions as the front.

The bottom board is six feet long and eighteen inches wide. This board is sawed into three parts. A piece, eight inches long at each end, is nailed to the upper boards, so as to rest upon the stand or frame that supports the hive. The middle part, being four feet eight inches long, is hung with butts to the back board, and may be swung down at pleasure. It is fastened up with hooks and staples in front. A narrow strip in front, four inches wide, for the lighting board. The bottom board as well as the outside of all the others, should be perfectly smooth; the inside should be left rough, and the comb may adhere better to the top and sides.

The two end boards of the hive are sixteen inches wide at top, twelve inches at bottom, and twelve inches high.

The partition boards are the same size as the ends, having a passage way at top and bottom, each six inches long and one inch high, and a circular opening in the middle of four inches diameter. If it be intended to confine the bees to any one room or rooms in the hive, the passages may be stopped by placing boards over them, and removed as the increase of the swarms may demand.

It does, in fact, appear to me, that *if* bees will go on increasing *ad infinitum* in one community, that this is the best of all possible hives; for it can be extended to any reasonable length, and room after room may be added, as may be necessary. If it should even be extended to forty feet, I think the height nor width would not need increasing; as there would be space sufficient to hold all the bees, and afford an easy passage to the boxes on the top for the surplus honey. I do not know of any greater objection to this length of hive, and the harmony of their operations, than in those swarms which occupy twenty feet of a dead tree, and issue out from three to four different holes in its trunk, which I have witnessed. I was once at the taking up of a bee tree that had strips of comb six feet long, and yielded upwards of two hundred pounds of honey.

Description of the Second Hive.—I will here observe, that I consider this the best plan that I have seen for ordinary sized swarms. The following account of it is given by the inventress:

"The Charlieshope hive, is thirteen inches square at the top: *but as the sides decrease in width to the bottom*, the base is narrower, being only seven inches on the flanks, and thirteen inches in front and at the back. The hive is in height about twenty-six inches in front, and twenty behind. Of course, the floor is an inclined plane. It is fastened behind with hinges, and at the sides with hooks and staples. The roof or cover, is like the rest of the hive, made of common inch board, with cleats screwed on the top to prevent it from warping. The top is screwed to the

hive in two places. Three holes are bored in this cover, of one inch diameter, and about a quarter of an inch apart, on a line with each other, and parallel with the front of the hive. Three holes are found to be necessary, as the bees would otherwise build in such a manner as to close them and prevent their ascent to the upper box, when that becomes necessary. The under part of the top or cover is *rough*, as the *propolis*, or bee glue, does not, at all times, adhere sufficiently well to a smooth surface. Every other part of the hive is as smooth as possible; and the whole hive, box and all, is well made and joined. The upper box is thirteen inches square, and the width of a board deep, from eight to ten inches. This box is likewise smoothly planed, excepting the inside of the top board, which is rough.

"The box sits snugly on the top of the hive; the cleats are placed in such a manner on the upper surface of the cover, as to fix the box firmly.

"When it is ascertained that the hive is full of honey, the plugs in the three holes are taken out. The bees may then ascend, and if the season be favourable, they will fill the box with comb and honey.

"About three or four inches from the top of the front and back of the hive, are two cleats, which serve to sustain the hive in a moveable frame, made of narrow slats of wood, which frame enables any one to carry the hive from place to place, as the hiving and other operations make it necessary. The hives are likewise suspended by these cleats, on permanent joists or scantlings in the apiary.

"Hives thus suspended are out of the reach of mice, and they are, too, better, on a variety of accounts. The opening and shutting of the floor allows of daily inspection. The floor can be cleaned often. The inclination of the sides and bottom allows the perspiration of the bees to flow off rapidly. This is a great point gained, as dysentaries are induced by the absorption of such acrid matter. The slope in the floor enables the bees to remove all extraneous matter, and to defend themselves better from robbers and intruders.

"The entrance to the hive is about three inches wide, and half an inch high. A door of wire, the meshes of which are small enough to prevent the entrance of the miller, rests behind two door posts made of needles. These needles are driven into the floor, close to the entrance. The little doors are always put behind the needles as soon as the bees are in for the night; and they are removed at daylight. About the middle of April, the doors are first used; and they are discontinued in two months. After the middle of June the floors are let down and are suffered to hang until daylight, when they are *gently* raised up and hooked."

I have made my hive larger for the purpose of holding several swarms; but I do not consider it so good for that purpose as the first—the bees having to travel too *far* to get into the surplus boxes from the main entrance. I intend, however, making holes in the *sides* of my hives, and putting on cleats at proper distances to slip in boxes for deposits of honey. I know of no reason why they should not work through the side as well as through the top of the hive. My hive is suspended *through* a frame stand by the aid of cleats, as is represented by Mrs. Griffith.

I will here make one remark which I consider important. Were I to build another hive on the plan of the first, the end and partition boards should be at bottom in the shape of the ends of the second hive. I find that my bees perspire so much as to collect in considerable quantities on the floor board. On the inclined floor this passes off rapidly, leaving them free from the unhealthy odor raising from that and other impurities, which otherwise remain on a level surface. Cross sticks should also be placed inside the hive, at proper distances, to prevent the comb from falling. ULMUS.

ART. XXXI.—*A Successful Method of Cultivating the Chrysánthemum indicum; by* Mr. W. MITCHINSON.

[FROM THE GARDENER'S MAGAZINE.]

Sir,—The following method of treating the chrysanthemum is, I believe, new; and, as it answers successfully, I think it may be acceptable to some of your readers.

In the plan of cultivation to be described, I propose to myself to obtain all the advantages of different heights, large flowers, and the best disposition of the whole plant during its flowering season.

To procure the highest growth, I detatch from the old plants the most promising suckers, about the first of March. These I place singly in small pots, and set them in a cold frame, giving the usual attention, and shifting them three times in the course of the summer.

My second are set from cuttings struck about the middle of May, placed singly in pots, and are shifted twice in the season.

The lowest grade, which form bushy plants, rise from 8 to 18 inches high. To obtain such, I do not keep them down by pruning, as is commonly done, but by layering some of the principal shoots in the following way:—Having some of each variety planted in the spring, on a south border, there they are allowed to remain till the middle of August, at which time they have formed fine bushy heads, and from these are to be produced my dwarf-sized plants. Previously to layering them, I select and bend down to the surface of the ground as many as are wanted, fixing them there by long hooks, at the place whence I propose the new roots shall proceed. In a few days the shoots regain their natural upright position; they may then be layered in pots placed close thereto, and half-plunged in the soil; this is easily done without risk of breaking off the points, to which they are liable by a different practice. When placed in the pots, fix them there by hooks, which should be long enough to pass through the hole at bottom, and thus keep the whole steady. The layers are assisted by regular watering, and having moss or short grass laid on the surface of each pot; when sufficiently rooted, they are taken off, and shifted into larger pots, in which they are intended to flower.

My next object with all these sets of plants, is to train them to the best form: as stage-flowers, they should present their best face to the spectator, every flower should be seen, and they should be regularly arrayed as possible. To train them to this effect, I place them, as soon as shifted for the last time, against a south wall, allowing them plenty of room from each other, plunging the pots in the ground, and fixing the principal shoot only with a shred to the wall. In this situation, they in a short time acquire the desired form, which they retain throughout the flowering season. The plants are not tied to sticks till the flower buds begin to form; they are then detached from the wall, but still kept as near it as possible. To give the necessary symmetry, a little contrivance must be resorted to; some of the longest side-branches which are not wanted, or may be spared from the top, are bent spirally downwards behind, and their points protruded through the foliage below, so that flowers may appear regularly over the face of the plant. I use small copper wire for this purpose, which I find much more suitable than either brass or thread.

Large flowers are obtained by a judicious thinning of the flower buds. Those sorts which have many secondary buds should be divested of them, especially if they are inferior in size and untimely in blowing. From one to three of the most promising will suffice for every side-branch; and in most cases one only may be enough, provided the buds are properly distributed. This thinning ought particularly to be practised on the Superb White, Two-coloured Red, Changeable Pale Buff, &c.; but such

as are cluster flowers should be thinned more sparingly; the Superb Cluster Yellow, for instance, which flowers in a kind of raceme, should be allowed to show its character.

I am, Sir, &c.

WM. MITCHINSON.

Courtlands, Jan. 18, 1828.

ART. XXXII.—*Culture of Ruta Baga.*

[FROM THE GENESEE FARMER.]

A wish to have others profit by my experience, induces me to send you, Mr. Editor, half a sheet of remarks on the culture of Ruta Baga, as a food for domestic animals. I have cultivated from half an acre to three acres of this root every year for thirteen years in succession, and feel competent to give rules for its culture, and confidence in recommending it as a valuable and profitable crop.

The soil must be rich and dry; and the more it inclines to a sand loam the better. Clay is the worst, and wet soils will not answer at all.

Preparations.—My general practice has been, to manure well a piece of pasture, or clover ley, from which the hay has first been cut, plough it handsomely over, and harrow it well.

Sowing, &c.—I sow in rows, at two and a half or three feet, with a drill-harrow. The sooner the preceding operations succeed each other the better. I have sown broadcast, but the expense of thinning and culture is increased. A man will drill in three or four acres a day. We allow a pound of seed to the acre, though half this, properly distributed, is enough. Sow from the 26th of June, to the 10th of July.*

Culture.—I use a cultivator, that may be graduated to the space between the rows, drawn by a horse, as soon as the plants can be well distinguished. This is repeated in a few days, back and forward, and the implement carried so close to the drills as to leave only strips of from four to ten inches, which are then thoroughly cleaned with a skim-hoe, and the plants thinned to eight or ten inches distance. The cultivator soon follows for a third time, and if necessary, the skim-hoe, when the crop is ge-

* A month later in this State.—*Ed. So. Agr.*

nerally left till harvest—the great aim is to extirpate the weeds, and to do this while they are small.

Harvesting is postponed as long as the season will permit. The roots are pulled up, and laid on the ground, the tops of the two rows towards each other. The pullies are followed by a man or boy with a bill-hook, who with a light blow cuts the tops as fast as three or four can pull. Three men will in this way harvest, of a good crop, 300 bushels in a day. The tops are gathered into heaps and taken to the yard in carts, daily, for the stock until they are consumed. An acre will give from five to ten cart loads of tops. The roots are piled in the field if dry—the pits two or two and a half feet broad covered with straw and earth, and as cold weather approaches, with manure, to prevent frost. N. B. With a crowbar make one or more holes on the crown of the pit, which must be left open, to let off the rarefied air and prevent the roots from heating.

Use.—The tops serve for autumn. As soon as the mild weather of spring will justify, I break through the frost, and take the contents of a pit to my barn, and cover the roots with straw or hay. From thence they are fed to my stock, being first chopped up with a *snik* (Dutch meat chopper) or spade. They are excellent for sheep, especially for ewes that have young—and hogs and horses eat them freely. Steamed, they are used in the north of England, for horses as a substitute for grain. I have fattened sheep and bullocks upon them with profit. They constitute, particularly from February to June, an excellent culinary vegetable for the table. A bullock will thrive fast upon two bushels a day, and will consume hardly any hay, and requires no drink.

Product and cost.—My average crop has been 600 bushels per acre, though others have raised much heavier products. The cost, in manure and labour, when they are secured for winter, has been from two to three cents per bushel.

N. B. Cattle or sheep, fattened upon this root, should be kept from eating them for eight or ten days before they are slaughtered, otherwise the meat will have an unpleasant savour.

Albany, Dec. 26. J. B.

Art. XXXIII.—*Of the proper Treatment and Food of neat Cattle generally, and of Cows in particular.*

[From the Complete Keeper of Cattle, or Farmer's and Grazier's Guide, &c.; by B. Lawrence.]

The profit and advantage that are to be derived from the keeping of neat cattle, or from the produce of the dairy, depend greatly on their treatment and management. Soil has a sensible effect on the quality of the pasturage, and this also operates similarly on the animals which graze thereon. In Exeter, the butter is excellent, but the cheese the worst in the kingdom; while in Somersetshire the reverse is the case; the cheese there manufactured is of a very superior quality while the butter is uniformly indifferent or bad. The richness of the butter made in Scotland, is generally attributed to the cows feeding upon the sweet and short pasture in the glens; the soils of other parts of the kingdom have also a similar effect on the animals fed thereon; but generally speaking, old pastures are the best; new laid ones being often productive of disease.

In natural pastures, there is usually a sufficient variety of good herbage; and if the animal be allowed to rove about, it will select such only instinct points out to be proper or agreeable to its palate; and in doing this uses such a degree of exercise as is conducive to health and perfect digestion. This is almost invariably the case where the animals are inured to the soil and climate; but when the farmer or dairyman is obliged to have recourse to artificial food and confinement, the animal becomes essentially different: an unlimited quantity of food is a temptation which few animals can withstand; and when it is not accompanied with a due portion of exercise often proves of bad, if not of fatal consequences. It is a fact, equally applicable to the brute, as it is disgraceful to the human being, that where the inordinate appetite for food is indulged, an inclination or sensation of thirst, is invariably felt; and that by freely indulging in either extreme, a capability for extension of appetite is engendered, which soon paralyzes the powers of the digestive system, and produces a train of disorders injurious to the whole animal economy in their existence, and totally destructive in their effects.

When the neat cattle, but particularly cows, are brought from a distant county to the farm or dairy, they will require particular care and attention until accustomed to the soil, food, and other local circumstances connected with their new residence. If they have travelled far, they should at first be put into the stable, or cow-house, and allowed a large quantity of litter, but must be taken out of the stable several times a day, for the benefit of fresh air. They should also be well rubbed and brushed

all over the body, particularly about the joints; and if they seem fatigued, their legs may be rolled in bandages kept wet with warm water, in which a little vinegar has been mixed.

They must not be put too quickly upon any particular diet; but gradually inured to that system of feeding which it is intended they shall follow. At first, food that is easy of digestion, is decidedly the best; and if cooked, it will be better still. Too much must not be given at any one time; let them have it in small quantities, and frequently. The water which they drink should at first have the raw chill taken off, and a little bran or meal may be put into it, together with a small quantity of salt.

If either of the cows should be near calving, let her be bled, but not too profusely; this will render her calving more easy, and less liable to accident.

The most healthy stables are those which are open to the east, or have an eastern aspect, and are built on a dry and elevated situation. It is a common practice to build them too close; and it is an equally erroneous opinion, that cold is injurious to cows, or that they should be carefully guarded against it: this opinion is productive of many of the worst disorders with which they are afflicted. The cow-house is, in general, not only very low, and with narrow openings, but it is also shut up closely as possible, if the weather happen to be a little severer than usual. A more pernicious or more fatal practice can scarcely be conceived. Experience has proved that cows kept in the open air, without the slightest shelter, suffer but little inconvenience, except in damp or wet weather; it is better, no doubt, to keep them in a more sheltered situation; *but the stable should never be completely closed up, however cold the weather may be*, although it is desirable that strong draughts of cold or damp air should be guarded against, especially in winter. It may be held as a general rule, that the stable is too close, when, on entering, the breath is affected, or any smell of urine can be perceived.

If it be important to keep cow-houses or cattle-stables well ventilated, it is no less so to keep them clean. Dung, if left therein, soon renders the air unwholesome, and engenders a train of putrid disorders. Cows in a stable should not be too close—a square space of six feet each way should be allowed to each cow. Two or three ventilators near the ground on the north side, affords, at a trifling expense, an excellent way of renewing or sweetening the air in stables in the summer time: and on the south side, in winter, without occasioning draughts: and these may be shut when necessary, either by means of straw or otherwise. The ground of the cow-house should be of brick work or stone; with the sides elevated just sufficient to cause it to drain towards the middle, where there should be a gutter, to carry off the urine and excrement, and convey them into a water-tight tank, or at all events, into a large covered hole on the out-

side; and by no means, as is too frequently the case, into an open ditch, on the outside. By these simple means, the animals, and their habitations may always be kept clean and sweet.

Art. XXXIV.—*Feeding Calves; by* J. W. Smith.

[from the genesee farmer.]

On a late visit to one of my friends in Farmington, Ontario County, who, by the by, I consider one of the best farmers in that section of our country, and who has eighteen of the finest calves (with one exception,) that I have seen, all of the short horned Durham and Dovenshire breeds. His mode of feeding them is the following, which I think worthy of imitation. He takes a plank of oak, three inches in thickness, and twelve feet long, and two feet wide. On either side of this plank, and about one inch from the outer edge of it, holes are bored in a slanting direction inwards towards the middle of the bottom of it, quite through it. These holes are five inches apart, from centre to centre, and are made with an inch and a quarter augur. In these holes are placed sticks, of the same size of the holes, and three feet six inches long. The upper end of these sticks are secured in a plank one and a half inch thick, and five inches wide, of the same length of the bottom, with holes of a similar size. On these, rafters are placed, and the whole is covered with common siding, cut so long as to project on either side a sufficient distance to cover the trough underneath, in which the grain or meal with which they are fed is to be placed. The ends are secured by sliding doors, made of light boards. This is supported by four legs of such a length as will raise the rack two and a half feet from the ground, and diverging outward so as to prevent its blowing over. The lower end of these legs are framed into two pieces of four by four scantling, with a piece pinned on across one or both ends, for the purpose of attaching a horse or oxen to it, when it may be necessary or convenient to move it to some other place. Attached to the legs is the trough for catching the litter that would otherwise fall on the ground, and be trodden under foot, while the animals were feeding from the rack, and also for feeding them with grain or meal. This is constructed of boards, and sufficiently high to prevent swine from reaching it.

The whole expense of such a rack will not exceed from three to four dollars, and will amply repay the expense the first winter or season of foddering, and will answer for twenty or twenty-five calves to feed at. Twenty can feed at it at one time. This will also answer a valuable purpose for feeding oxen in the spring, as by this means they *waste no hay*, or meal, or grain, if fed with it; but can be placed in a shade, in the open air, which is of great consequence in warm *faint* days in the spring.

N. B. The sides of the trough for feeding meal or grain, should be placed at an angle of about 45 degrees with the bottom, so as the more readily to catch all the hay which may litter down during the animal's feeding.

J. W. SMITH.

Lockport, Jan. 12, 1833.

Art. XXXV.—*Soap.*

[FROM THE GENESEE FARMER.]

As this is the season of the year when most of our housekeepers attend to making soft soap for the use of the family, we trust a few observations may be acceptable.

Much difficulty is frequently experienced in this business, and many *vulgar errors* have been connected with it; and we have heard women declare that they believed their soap was *bewitched*. When the principles are once understood, the whole process is easy and simple. First, then, it is proper that housekeepers should know the properties of the component parts of soap.

There are two fixed alkalies used in soap making, viz. potash and soda. Potash is called the vegetable, and soda the mineral alkali. Either of these alkalies will unite with grease and form soaps: potash and grease make soft soap only, but soda and grease make hard soap. Both these alkalies have a strong affinity for acids—uniting with them, and forming what is generally called neutral salts. Thus potash and nitric acid forms saltpetre; soda and sulphuric acid form glauber salts, and soda and muriatic acid, or spirits of salt, form common salt.

Now no woman in her senses would think of making soap with either of these salts; and yet the base of either, when separated from the acid, would form when mixed with grease, as good soap as if they had never been united.

There is also another acid which combines with these alkalies, which will equally prevent their uniting with grease as either of the before mentioned acids—that is carbonic. Now this acid is continually floating in the atmosphere unseen, and will combine with potash or soda whenever it comes in contact, forming a carbonate of soda or potash—neither of which will unite with grease to form soap.

Much of the difficulty which housekeepers meet with in soap making, arises from their ley having become more or less saturated with carbonic acid. Ashes which have laid long in a damp place, or become damp by any other means, will absorb carbonic acid, or if the ley is allowed to stand too long after it is leached in an open vessel, the same thing will take place. Lime is often placed in the bottom of the leach, and but few can tell why they do it. If the question is asked, the reply is—because it makes the ley clearer. Lime has a stronger affinity for carbonic acid than potash has, and of course will separate it from it. Common limestone is lime and carbonic acid; when limestone is burned in a kiln, the carbonic acid is separated by heat, and quicklime is formed. Now if this quick or fresh-burnt lime is placed in the bottom of the leach and the ley made to pass through it, it becomes purified from the acid, and the only thing necessary then to have it unite with grease, is to have it of sufficient strength. This may be ascertained by its specific gravity—to learn which, put a new laid egg into it; if the egg floats, the ley is strong enough; if it sinks, the ley must either be evaporated by boiling, or by again leaching it through ashes. The grease made use of is the refuse fat of animals, and before it is united with the ley, should be freed from all the salt by boiling it in water. The quantity necessary for a barrel of good soap is about sixteen pounds, or half a pound to a gallon.

Soap, when well made, should be thick and salve-like, capable of being spread thin upon cloth without flaking or roling off. If to such soap about an equal quantity of soft water is added, the soap becomes hard and liver-like, capable of being taken up in the hand. This many think is desirable—especially the soap-boilers who make it for sale, as they make double the profit they would on the other quality.

Some housekeepers practice making their own hard soap. This is done by adding salt to the soap after it is well made, while it is yet boiling. The effect is thus explained. Salt is soda and muriatic acid. Potash has a stronger affinity for muriatic acid than soda has, and when they come in contact, as in this case, the potash decomposes the salt and combines with the muriatic acid, forming a muriate of potash—leaving the soda pure to form a hard soap with the grease; the muriate of potash will be found on cooling, in solution at the bottom, being of

greater pecific gravity than the soap. The salt should be added by small quantities until the separation takes place, which may be known by the soap becoming curled; after which it should be allowed to stand until cold, when it may be cut into bars or cakes, as suits the operator. Many suppose that rosin is necessary to harden the soap. This is not the case, it is used as a matter of profit—not of necessity.

The common yellow colour of soft soap is owing to the iron contained in it, as the oxide of iron is dissolved by potash. Where white soap is desirable, it may be made by substituting pearlash or carbonate of potash, and abstracting carbonic acid by lime—and by using lard or other white grease, the purest white soap may be made.

Art. XXXVI.—*On Watering Neat Cattle.*

[FROM THE FARMER'S AND GRAZIER S GUIDE.]

Improper feeding as we have endeavoured to show, injurious to neat cattle generally; but improper management, with respect to water, is productive of more serious consequences still; and is the chief origin of what is called among veterinary surgeons, *predisposition to disease;* in other words, the animal structure is, by mismanagement, rendered peculiarly liable to disease, and is then acted upon by the slightest cause.

Thus, a superabundance induces the quarter-ill, red water, and scouring; while a smaller quantity than is proper, is often a main cause of inflammatory disorders.

Filthy or impure water should be avoided, as productive of the most serious consequences; it has been proved beyond all doubt, that impure water given to pregnant cows is a more certain cause of abortion, or slipping of the calf, than any other, and also engenders bad udder, red water, and scouring, and materially diminishes the quantity of the milk, and injures the quality of the butter and cheese.

Neat cattle, but particularly cows, should be watered twice a day, and in summer, three times; this is the more necessary when they are kept on dry food: the water should be pure and transparent; the best of all is that which has been agitated by passing through a mill as it is then softer, and more favourable to digestion. It is a dangerous prejudice, that muddy or stagnant water is not injurious: we have just given a decided opinion on

this subject, and shall in the course of our observations give several cases to support that opinion.

It is always advisable, when it can be conveniently accomplished, to pump the water intended for cattle-drink into troughs of stone or cement; the best ponds of water being liable to impurity from several causes: as one of these, it may be observed that they invariably void their excrement either in the pond or near it, immediately after drinking! and as there is generally a sloping bank to the pond, the dung must in some degree run down into the water, and by engendering various descriptions of the insect and vermin race, render it impure and unwholesome.

The water of ponds surrounded with ash trees is often during the summer covered with the cantharis or blistering fly, which the wind blows from the leaves of the trees. These insects when swallowed with the water are certainly poisonous. This is particularly the case in France, but not so much so in England; still, the same cause exists, though in a less degree, wherever ponds are overhung by banks of trees.

Water is rendered much softer, and produces more milk by being blanched, as is termed; that is, by having a little bran or meal stirred into it; but water so prepared must not be kept too long, as it is apt to ferment and become sour. During the heat of summer, cows are very apt to become costive, particularly where they are kept principally on dry food; in this case it will be necessary to give them water in which bran and linseed have been boiled; and even if they are not costive it will be proper to add occasionally, about a sixth part of a pint of vinegar to every pail of water, and especially so when the water is of an indifferent quality, or when the weather is very hot and dry.

It is a fact, that when cattle have been accustomed to drink impure water, even in the washing of a dung heap, they will acquire a relish for it and refuse good water if offered to them: but the consequences arising from this practice, although not always immediate in their visible effects, are certain, and sap the very vitality of the animal's constitution. We have stated that such a practice is a frequent cause of abortion, and productive of various and serious diseases; and we here repeat the caution from a conviction that no other water should ever be given to cattle than what is pure, sweet, and wholesome; and that the use of that which is impure, although used for a time with apparent impunity, will not only inevitably present disease, but will lay the foundation of a train of disorders which will rarely, if ever, be eradicated.

Art. XXXVII.—*On Pruning.*

[FROM THE GENESEE FARMER.]

I have had some experience in trimming fruit trees; but it is not improbable that I may yet profitably learn new methods in this business. In cutting off limbs of an inch or more in diameter, I have more commonly had paint or some composition applied to the stumps, and I think with decided advantange. Paint is not so durable as tar boiled with brick dust, or as the indurated tar and grease from the hubs or axles of a wagon; but we have used it more frequently because it was more conveniently obtained. As large stumps must remain exposed for several years before they can be covered by the new wood, they should not be forgotten, but new coatings after the lapse of two or three seasons, should be successively applied.

The importance of this operation, increases with the size of the limb removed; and also with its position on the tree. I know not how we can prevent the trunk of an apple tree from becoming hollow, when a large branch is cut off at the fork, unless we apply an artificial covering to the part. I am aware that trees properly trimmed when young, will not require such excissions; but I am also convinced that among the neglected trees of common orchards, such cases frequently occur.

I have examined several apple trees to-day, from which large limbs had been taken. The painted or covered stumps are uniformly sound, while such as have been neglected, are more or less decayed, according to situation; and may hereafter accommodate the wren, or the blue-bird, with a hole for its nest.

In regard to the season for trimming, I am rather partial to the winter, or indeed to any time when the sap does not flow. The stump being comparatively dry, especially if we defer the coating for a few days, I have believed it in a better condition to receive the paint, than when the buds are just opening into leaf. The argument that the new wood immediately begins to cover up the wound, I think possesses but little weight.

Greatfield, Jan. 21, 1833. D. T.

PART III.

MISCELLANEOUS INTELLIGENCE

Picking Cotton.—A trial of speed, of a novel character, was made in October last, at Tarboro' N C. The parties engaged were eight slaves, the property of one Richard Hines, Esq. and the struggle was to see who could pick out the greatest number of pounds of cotton between sunrise and sunset. The performances of the negroes were as follows:

Cherry,	240 lbs.
Little Austin,	214
Ned,	185
Lucy,	185
Hampshire,	227
Big Anthony,	215
Little Anthony,	184
Penny,	154

Averaging 200½ lbs. to each hand. Two days after, another trial was made, in which

Cherry picked	280 lbs.
Little Austin,	271
Ned,	250
Lucy	216
Hampshire,	220
Little Anthony,	207

Great interest seems to have been excited by these races, and Mr. Richard Hines, the owner of the slaves, has put forth a proclamation, in which he offers a bet of $100 upon the girl Cherry against any one hand that can be brought against her.—*N. Y. Standard.*

Improvement of the Potato.—A friend has favoured us with the following extract from an English paper, (says the N. E. Farmer.) We hope that our Horticultural Society will take measures to introduce and ascertain the value of this new product.

"The *Oxalis Crenata* has been introduced into this country from South-America, and is likely to be extensively cultivated, as decidedly preferable to the common potato. A root was brought over, in 1830, by Mr. David Douglas, and planted by Mr. Lambert; and a few small tubers were exhibited to the Linnæan Society. One of these was planted by Mrs. Hirst, in the garden of Great Ropers' Hall, near Brentwood, and has succeeded remarkably well. It was first put into a small pot in the end of April, and in the month of May the pot was placed in the flower-garden and broken, and the parts removed. This precaution appears to have been unnecessary, for it has stood the frost remarkably well, and on the 5th of this month, when it was dug up the leaves were green. The root planted was about half an ounce in weight, and the roots produced were about ninety in number, in a space not exceeding nine inches in diameter and six inches deep. The aggregate weight was upwards of four pounds. A few of the roots were boiled, and, when eaten, were found to resemble the potato, but unanimously admitted by all the party to have a

more agreeable flavour. Such a result is very promising, and when we consider that the common potato (*Solanum Tuberosum*) was, for a hundred years confined to gardens, and that roots were for a long time not larger than beans, and were watery, we may reasonably expect that cultivation may do much to enlarge the size of the roots of the oxalis, and perhaps improve the flavor beyond what it is at present It has a fine yellow flower, and is ornamental in the garden. The time of flowering is August."—*Mirror.*

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Broken Wind.—A broken winded horse had been kept in a field where there was not any water except in the bottom of an old lime-kiln, and had recovered his wind. The owner ordered a stable shovel full of quick lime to be renewed every five or six days, and the water to be poured off, and a bucket of it given every day to a broken winded coach horse aged eight years, which had almost a constant cough. The horse was supplied with water thus prepared for about five weeks, and kept in the stable. He is now perfectly recovered in his wind, and free from a cough.—*Farmer's Reporter.*

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Improvement in Candles.—I steep the common wick in lime-water, in which I have dissolved a considerable quantity of nitre or salt-petre. By this means I secure a purer flame and a superior light; a more perfect combustion is insured; snuffing is rendered nearly as superfluous as in wax candles, and the candles thus treated do not "*run.*" The wicks must be thoroughly dry before the tallow is put to them. J. Murray, F. L. S.—*Ib.*

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Potato Paste.—Mash boiled potatoes very fine, and while they are warm add a sufficient quantity of butter and make them boil together; then before the paste gets cold flour the board to prevent it from sticking, and roll it to the thickness wanted.—*Ib.*

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To promote the Growth of Trees.—Some separate the dry bark of fruit and forest trees to promote their growth, and prevent the bark *binding* too much, This disfigures the tree, making seams in the trunk, and makes it grow in angles. The best way is, when the sap is forced up, by warmth of the spring, to scrape off the scaly particles of the dead bark, and wash the trees repeatedly during the week with soap suds, &c. Trees of considerable age will then have a youthful appearance, be more thrifty, and in the case of fruit trees, the fruit will make more cider, than that grown on scurvey, moss grown trees.

Put cinders, bones, and stones, about the roots of pear trees; it will increase their growth one-third, and save them from the blight.—*Gen. Far.*

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To Destroy Fowl Lice.—A decoction of tobacco, mixed with a little spirits of turpentine and gunpowder, applied to the nests and skin of fowls, is recommended to destroy the lice.—*N. Y. Far.*

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To Cure Founders—Col. B. Chambers, of Paris, Ky., pounds and dissolves in water a lump of alum the size of a walnut. With this liquid the horse is drenched, when he is thrown into a profuse perspiration, and immediately relieved.—*Ib.*

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New-Fruit.—"*Berberis Parviflora* deserves to be particularly noticed, as it is likely to become an addition of no ordinary description to the exotic fruits already in this country, *the fruit being very fine,* and used in its native country, (*the Straits of Magellan*) for making tarts and puddings.

"It is described as growing from seven to eight feet high, producing fruit abundantly; *the berries being nearly as large as those of the black cluster grape,* produced singly on short footstalks. This desirable plant was sent home by Mr. James Anderson, the intelligent and enterprising botanical collector."—*M'Intosh's (Br.) Flora and Pomona.*

The Compass Plant—Mr. Smith.—Inclosed, I send you a few of the seed of a plant, growing in the great prairies of the west. It is called the compass plant by some and by others the rosin weed. It is one of the most extraordinary plants in nature. The name of *compass plant* proceeds from the fact of its leaves, which are very large, rising from the root to the height of from one to two feet, presenting their edges almost invariably to the north and south—and consequently their broadsides to the east and west. This circumstance renders this plant almost an unerring guide to the traveller in cloudy days, who may be caught in those large plains, where, to use an expression sometimes used in those regions, he is out of sight of land—that is of growing timber, whereby to direct his course.

Such is the great uniformity of surface in those extensive prairies, that the most skilful woodsman would be unable to steer his course in a cloudy day, but for the aid of this plant. And the fact of its being found (so far as I have heard) only in those places, where the polarity of its leaves, so to speak, renders it eminently useful to man, seems to present it as one of the strongest proofs of special providence that has been presented to my mind.

The name of *rosin weed*, proceeds from a gum which exudes from its stalk, and dries and hardens in the sun, resembling considerably in appearance, taste and smell, the rosin of the pine—but I should say more pleasant and aromatic. It is quite adhesive, and I was told had been used as a substitute for shoemakers' wax.

The root of this plant somewhat resembles the parsnip, both in size and appearance. When cut in the spring by the ploughshare in turning over the sod, that portion left in the ground, discharges very freely a gummy substance about the consistency of honey, having very much the taste and odour of the gum which exudes from the stalk. The stalk grows to the height of from four to six feet.

Whether something useful might not be extracted from these roots, is, I think, worthy of experiment. If so, it could be produced in the prairies to any extent. Whether it will grow out of the prairies, has not, so far as I know, been tried. I mean to try it myself this spring—and have supposed a few of the seed would be acceptable to you. They are of last year's growth sent me by a friend last fall from Missouri.

Very respectfully, THOS. SPEED.

Nelson Co. (Ken.) Feb. 17, 1833.

[*Remarks.*—From the above description we are entirely unable to identify the "compass plant" with any one known to us. The *seed* seem to belong to the natural order of compositæ, resembling those of the dahlia somewhat. We should be glad, if any of our friends know the plant, for a more particular account of it.]—*Ed. Am. Far.*

Result of feeding upon Turnip and Straw.—Adam Ferguson gives us, in the Quarterly Journal of Agriculture, the result of feeding two steers twenty-five weeks upon *turnips and straw*, the turnips half Swedes, or ruta baga. The steers were half and two-thirds short horned blood. No. 1 gained 406 lbs., No. 2 gained 336 lb. The daily consumption of turnips was about 200 lbs. per day to each animal. I once fed four bullocks about seventy days upon ruta baga, at the rate of two bushels per day. They ate hardly any thing else, even refusing oil cake. They required no drink. The turnips thus fed produced me about $75.—*Gen. Far.*

Poisoning of Vegetables.—M. Marcet, of Geneva, has given us the result of his experiments with poisons upon plants. A vessel containing plants of the bean, with five or six leaves each, were watered with two ounces of water containing twelve grains of oxyde of arsenic in solution. In thirty-six hours the plants faded, drooped and turned yellow. Attempts to restore them by abundant waterings failed. A branch of the rose, with an expanding flower, placed in a like compound, was completely withered and dead in five days,

while a like one in pure water continued fresh, and the flower fully expanded. Arsenic was next introduced into a slit made in the bark of the lilac. In a short time the leaves withered and fell, and the tree died, even a branch that came out below the incision. The vegetable poisons were then tried Plants would not exist in a healthy state, when watered with water containing opium, hemlock, foxglove, or other narcotics. The absortion of one tenth of a grain of oxalic acid (the acid of sorrel) killed a healthy rose bush in forty-eight hours *Query*—Is not the infertility of fields abounding in sorrel owing in some measure to the presence of this acid?—*Gen. Far.*

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Facts in Relation to Breeding Live Stock.—Professor Sturm, of Bonn, lays down the following as facts that occur in the breeding of live stock: "The male parent is the preserver and creator of a race. The first changes in crossing are always exhibited in those parts that possess the power of being reproduced, as the hair, horns, hooves, &c. The fleshy parts change slowly, in proportion as the mother has much of the blood of the original race The first changes take place in the head, and are gradually developed towards the hinder quarters of the animal. The author also maintains, that to produce a new race, as many generations are necessary as years are for perfecting their teeth." The writer is Director of the agricultural institution at Bonn.—*Facts from Bulletin des Sciences Ag.*

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Manure for Wheat.—Dr. Joseph E. Muse, states the opinion, that animal manures are particularly necessary for wheat crops, because gluten, the clear actuistic proximate principle of wheat, contains nitrogen, which assimilates to its animal bodies.—*Silliman's Journal.*

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On the use of Gypsum for leguminous Plants.—As the seeds of pod-bearing plants contain gypsum already, and have great tendency to absorb all the soil can contain of it, gypsum ought not to be applied to the soil destined for the culture of this family, *when grown for seed*, because it imparts such an energy of vegetation, that it stimulates them constantly to put forth very succulent leaves—it produces great vines, but a small crop. When wanted for green fodder, it serves an excellent purpose.—*Bull. des Sc. Agri.*

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To boil Peas or Beans.—That dry peas or beans may readily boil soft in hard water, throw a small quantity of sub-carbonate of soda into the vessel in which the dry seeds are put to boil.—*Ib.*

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The Dahlia—Which now competes with the finest flowers of the garden, was first introduced into Spain from Mexico, in 1787. In 1802, three specimens reached Paris, and were cultivated in the house, and only propagated by seed. It was subsequently introduced into England. It flowers was originally single. The double and inconceivable variety which now grace our borders, are principally the result of the gardener's skill. The finest new varieties now sell in England as high as 7*s.* and 10*s.* sterling a plant or root, in such high estimation are they held by florists. B.—*Gen. Far.*

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Statistic.—Dupin states, that in Great-Britain the animal power is eleven times as great as the manual power, while in France it is only four times as great. Also, that Britain consumes three times as much meat milk and cheese as France. In Hanover there are 193 horses to every 1000 inhabitants, 145 in Sweden, 100 in Great-Britain, 95 in Prussia, 79 in France.—*Bulletin des Sciences Agricoles et Economiques.*